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PATENT
Atty. Docket No. 27600/X046A

IN THE UNITED STATES PATENT
AND TRADEMARK OFFICE

Applicant(s): James L. Warmus et al.

Serial No.: 10/755,743

Filed: January 12, 2004

For: Imposition Process and Apparatus for Variable Imaging System

Group Art Unit: 2622

Examiner: Unknown

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Erin J. Fox
Registration No. 52,261

Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR RECONSIDERATION OF PETITION TO MAKE SPECIAL

Sir:

Applicants, by their attorney, hereby request reconsideration of the "Petition to Make Special Under MPEP § 708.02" filed by applicants on March 29, 2004. Pursuant to the examiner's "Decision on Petition to Make Special," copies of each reference most closely related to the subject matter encompassed by the claims are enclosed herewith. Further, the references are fully discussed herein, pointing out with particularity how the claimed subject matter is patentable over the references.

EP 0602547 discloses a reproduction process system for executing a variety of reproduction-related processes without specifying individual page construction data for each item. In the reproduction process system, page layout data is generated and stored, wherein the page layout data represents the positions of image parts including picture data and linework data on a page. EP 0602547 does not disclose or suggest a method or apparatus for

controlling an electronic press that separates master data from position data in preparation for rasterization, as recited by claims 14-33 of the present application.

Gauthier U.S. Patent No. 5,729,665 discloses a process for printing different versions of a document defined in one or more template files developed by a publisher. The template files include information associated with the placement and appearance of fixed information and variable information on pages. Data representing the variable information are stored in a database. Initially, the template files are processed to produce bitmaps. More specifically, fixed portions of each template file are ripped (i.e., converted to a bitmap) until an area that is to contain variable information is reached. The areas containing variable information are not ripped. Instead, the location of each area is stored as well as the graphics state defining the appearance of the variable information to be reproduced in such area. Thereafter, ripping of subsequent portions of the file continues until a next variable information area is reached, whereupon the location and graphics state of the next area are stored. This procedure continues until all the template files are processed to create bitmaps representing the fixed portions of the template files. Bitmaps are then created for each area of variable information. This is accomplished by building a bitmapped font cache for each stored graphics state and deriving a bitmap for the associated area by assembling the bitmapped characters from the font cache in accordance with data stored in a database. The bitmaps of the fixed portions of the template files are merged with the different variable data bitmaps to create bitmaps of each of the versions of the document. Gauthier does not disclose or suggest a method or apparatus for controlling an electronic press that separates master data from position data in preparation for rasterization, as recited by claims 14-33 of the present application.

"Digital Color Printing in Japan: A Report from Early Users," The Seybold Report on Publishing Systems, volume 24, number 13, March 13, 1995, pp. 13-19 (hereinafter referred to as "The Seybold Report"), discloses merging one or more items from a file containing variable data (text or images) with static content in a predefined page layout. Thereafter, the result of the merging is rasterized and provided to a print engine. Similar to Gauthier, The Seybold Report also does not disclose or suggest a method or apparatus for controlling an electronic press that separates master data from position data in preparation for rasterization, as recited by claims 14-33 of the present application.

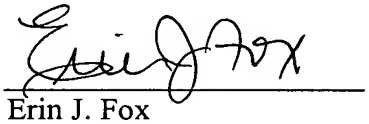
Buchanan U.S. Patent No. 5,267,155 discloses a document generation system based on a template document having static text and "holes" associated with records in a database.

The database records consist of multiple text phrases for possible insertion in each hole. When a finished document is to be created, the template document is recalled and the text phrases for each hole are displayed to permit selection thereof for placement into the finished document at the hole location. Buchanan does not disclose or suggest a method or apparatus for controlling an electronic press that separates master data from position data in preparation for rasterization, as recited by claims 14-33 of the present application.

Reconsideration of the "Petition to Make Special Under MPEP § 708.02" filed by applicants on March 29, 2004, is respectfully requested.

Respectfully submitted,

McCracken & Frank LLP
200 W. Adams
Suite 2150
Chicago, IL 60606
(312) 263-4700
Customer No.: 29471

By: 
Erin J. Fox
Reg. No: 52,261

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(71) Applicant: **Dainippon Screen Mfg. Co., Ltd.**
1-1, Tenjinkitamachi
Teranouchi-Agaru 4-chome
Horikawa-Dori
Kamikyo-ku Kyoto 602(JP)

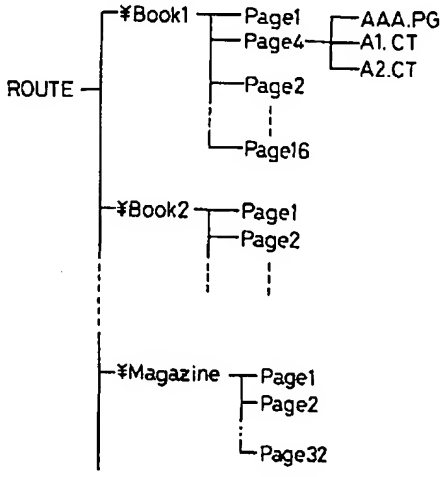
(72) Inventor: **Nakamura, Norihiko, c/o Dainippon Scr. Mfg. Co Ltd**
1-1, Tenjinkitamachi,
Teranouchi-agaru 4-chome
Horikawa-dori, Kamikyo-ku, Kyoto(JP)

(74) Representative: **Goddar, Heinz J., Dr. et al**
FORRESTER & BOEHMERT
Franz-Joseph-Strasse 38
D-80801 München (DE)

(54) Method of executing a reproduction process and apparatus used therefor.

(57) The present invention provides an improved reproduction process system for executing a variety of reproduction-related processes without individually specifying page construction data each time, thus improving working efficiency of each process worker. In the reproduction process system of this invention, a magnetic disk unit includes a plurality of job name directories each having a plurality of page number sub-directories. Each page number sub-directory stores page layout data corresponding to a page specified by the page number, picture data, and linework data. When the process worker specifies a desirable job name and a target page number, data of a target page corresponding to page layout data in a page number sub-directory specified by the desirable job name and the target page number are automatically displayed on a CRT screen.

Fig. 16



EP 0 602 547 A2

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a method of executing a reproduction process for a variety of prints and also to an apparatus used for the reproduction process. Description of the Related Art

Reproduction process systems are widely used to carry out a computer-aided page make-up process. Typically a reproduction process system executes a series of prepress works including a first reproduction process and a second reproduction process. In the first reproduction process, picture data, character data, linework data, and figure data are respectively input from an input scanner, a photo type setting machine, a linework input scanner, and a design system. In the second reproduction process, these data are processed for reproduction with one or a plurality of process terminals. The second reproduction process includes a routine of setting process information such as "Trapping", "Outline", or "Overprinting" in a mask area defined by figure data, and another routine of outputting finally assembled composite data to an output scanner.

In the first reproduction process, a variety of input data are temporarily stored in an external memory unit, such as a magnetic disk unit, before specific picture data is allocated in the form of a file to figure data defining a position of a mask area on a certain page. The figure data is then stored in the external memory unit as page layout data, which represents a file name of the specific picture data specified for the position of a mask area defined by the figure data. Page layout data and picture data and linework data attributed to the page layout data constitute page construction data.

In the second reproduction process, page layout data stored in the external memory unit is displayed on a monitor screen. A process worker specifies process information or executes another required process through interaction with the monitor screen. Not only page layout data but picture data and linework data specified by the page layout data are selected out of the external memory unit and displayed on the monitor screen. Since both the page layout data and the picture and linework data are stored in a specific position, for example, in a specific directory, in the external memory unit in the first reproduction process, the picture data or the linework data are not separately read out based on a data name specified by the page layout data.

A second process worker in the second reproduction process receives both a working instruction specifying required operations and a specification including file names of page layout data and those of picture or linework data prepared by a first process worker who executed the first reproduction process. The second process worker then specifies required page layout data and picture and linework data as working data according to the specification.

In a conventional system, the process worker selects and specifies required page construction data including page layout data, picture data, and linework data each time when the worker executes a reproduction-related process with a process terminal. This consumes substantial time and labor, thereby lowering working efficiency.

SUMMARY OF THE INVENTION

The object of this invention is to execute a variety of reproduction-related processes without individually specifying page construction data each time, thus improving working efficiency for each process worker.

The present invention is directed to reproduction process apparatus for executing a variety of reproduction-related processes, which apparatus comprises a memory for storing page construction data including page layout data and image part data. The page layout data represents positions of a plurality of image parts laid on one page, and the image part data represents the plurality of image parts. A working memory is provided for storing data used in execution of each of the variety of reproduction-related processes; a hierarchical memory for storing first hierarchy data including a plurality of job names each representing a print, second hierarchy data including a plurality of page numbers, and third hierarchy data including a plurality of names of the page construction data. Each of the plurality of job names have at least one page number as the second hierarchy data, and each of the plurality of page numbers have at least one name of the page construction data as the third hierarchy data. Page number specification means are provided for selecting a specific page number from the plurality of page numbers, and data transfer means are provided for comparing the specific page number with the second hierarchy data to extract at least one name of the page construction data corresponding to the specific page number from the third hierarchy data, and transferring the page construction data specified by the at least one name of the page construction data from the memory to the working memory.

In the preferred embodiment, the apparatus further comprises a plurality of process means for individually executing the variety of reproduction-related processes; process specification means for specifying a certain process; and selection means for selecting specific process means for executing the certain process out of the plurality of process means and activating the specific process means

to execute the certain process according to data stored in the working memory.

Preferably, the plurality of process means comprises process information specification means for setting desirable process information. The process information includes first through third process titles, with the first process title indicating a process of producing an overlapping area between two image parts, the second process title indicating a process of making a margin of a predetermined width around a contour of an image part, and the third process title indicating a process of printing a black character over a background.

The apparatus further comprises picture image scanning means for scanning at least one picture image in an original to capture picture data; linework image scanning means for scanning at least one linework to capture linework data; and layout data input means for tracing a line in a mechanical layout sheet to input the page layout data.

Alternatively, the apparatus further comprises icon display means for displaying each of the plurality of page numbers as an icon, wherein the page number specification means further comprises icon movement monitoring means for monitoring a movement of the icon moved by operator.

The present invention is also directed to a reproduction process apparatus for executing a variety of reproduction-related processes, and includes a memory for storing page construction data including page layout data and image part data, the page layout data representing positions of a plurality of image parts laid on one page and the image part data representing the plurality of image parts. Also included is a working memory for storing data used in execution of each of the variety of reproduction-related processes, a hierarchical memory for storing first hierarchy data including a plurality of job names each representing a print, second hierarchy data including a plurality of page numbers, and third hierarchy data including a plurality of names of the page construction data. Each of the plurality of job names has at least one page number as the second hierarchy data, each of the plurality of page numbers has at least one name of the page construction data as the third hierarchy data. Job name specification means are provided for selecting a specific job name out of the plurality of job names, and data transfer means are provided for comparing the specific job name with the first hierarchy data to extract all names of the page construction data corresponding to the specific job name from the second hierarchy data, and the third hierarchy data, and transferring the page construction data specified by the all names of the page construction data from the memory to the working memory.

In the preferred embodiment, the apparatus is further comprised of a plurality of process means for individually executing the variety of reproduction-related processes; process specification means for specifying a certain process; and selection means for selecting specific process means for executing the certain process out of the plurality of process means and activating the specific process means to execute the certain process according to data stored in the working memory.

Preferably, the plurality of process means comprises process information specification means for setting desirable process information, the process information including first through third process titles, with the first process title indicating a process of producing an overlapping area between two image parts, the second process title indicating a process of making a margin of a predetermined width around a contour of an image part, and the third process title indicating a process of printing a black character over a background.

Moreover, the apparatus is comprised of a pattern memory for storing a signature pattern representing a page signature pattern on each printing plate. The plurality of process means comprise output means for outputting the page construction data according to signature data, and the output means further comprises signature data layout means for allocating the page construction data corresponding to the all names transferred to the working memory to the signature data for each page according to the signature pattern.

According to another aspect of the present invention, the apparatus further comprising picture image scanning means for scanning at least one picture image in an original to capture picture data, linework image scanning means for scanning at least one linework to capture linework data, and layout data input means for tracing a line in a mechanical layout sheet to input the page layout data.

According to still another aspect of the present invention, the apparatus further comprising icon display means for displaying each of the plurality of job names as an icon, wherein the job name specification means further comprises icon movement monitoring means for monitoring movement of an icon moved by the operator.

The present Invention is also directed to a method of executing a variety of reproduction-related processes, the method comprising the steps of (a) storing page construction data including page layout data and image part data, the page layout data representing positions of a plurality of image parts laid on one page, and the image part data representing the plurality of image parts; (b) preparing a working memory for storing data used in execution of each of the variety of reproduction-

related processes; (c) storing first hierarchy data including a plurality of job names each representing a print, second hierarchy data including a plurality of page numbers, and third hierarchy data including a plurality of names of the page construction data, with each of the plurality of job names having at least one page number as the second hierarchy data, and each of the plurality of page numbers having at least one name of the page construction data as the third hierarchy data; (d) selecting a specific page number out of the plurality of page numbers; and (e) comparing the specific page number with the second hierarchy data to extract at least one name of the page construction data corresponding to the specific page number from the third hierarchy data, and transferring the page construction data specified by the at least one name of the page construction data to the working memory.

The present invention is also directed to a method of executing a variety of reproduction-related processes, the method comprising the steps of: (a) storing page construction data including page layout data and image part data, with the page layout data representing positions of a plurality of image parts laid on one page, and the image part data representing the plurality of image parts; (b) preparing a working memory for storing data used in execution of each of the variety of reproduction-related processes; (c) storing first hierarchy data including a plurality of job names each representing a print, second hierarchy data including a plurality of page numbers, and third hierarchy data including a plurality of names of the page construction data, with each of the plurality of job names having at least one page number as the second hierarchy data, and each of the plurality of page numbers having at least one name of the page construction data as the third hierarchy data; (d) selecting a specific job name out of the plurality of job names; and (e) comparing the specific job name with the first hierarchy data to extract all names of the page construction data corresponding to the specific job name from the second hierarchy data and the third hierarchy data, and transferring the page construction data specified by the all names of the page construction data to the working memory.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects, features, aspects, and advantages of the present invention will become more apparent from the following detailed description of the preferred embodiment illustrated in the accompanying drawings in which:

Fig. 1 is a schematic view illustrating a reproduction process system 10 embodying the instant invention;

Fig. 2 is a flowchart showing a series of reproduction-related processes executed by the reproduction process system 10;

Fig. 3 conceptually shows a structure of page layout data PLD;

Fig. 4 shows a page image corresponding to the page layout data of Fig. 3;

Fig. 5 is a flowchart showing details of the job management process of step S4 in the flowchart of Fig. 2 executed by any one of reproduction process terminals 20a through 20n;

Fig. 6 shows a job information window W1;

Fig. 7 shows an output scanner identification menu MN1;

Fig. 8 shows a signature pattern menu MN2;

Fig. 9 illustrates a quarto print;

Fig. 10 illustrates a layout of four films;

Fig. 11 shows a page list display window W2;

Fig. 12 is a diagram of a directory structure for the magnetic disk unit 32 of Fig. 1 in creation of job information;

Fig. 13 is a block diagram illustrating the relationship between a management information table TBL1 and a page information table TBL2;

Fig. 14 is a flowchart showing the job and page layout process at step S9 of Fig. 2 executed by any one of the reproduction process terminals 20a through 20n;

Fig. 15 is a diagram illustrating an exemplified process of setting page layout data in a HD window W3 to one of the icons ICN1 through ICN4 in the signature pattern-display second sub-window W22;

Fig. 16 is a diagram of a directory structure for the magnetic disk unit 32 after execution of the process shown in Fig. 15 for setting page layout data;

Fig. 17 is a flowchart showing the reproduction specification process at step S12 of Fig. 2 executed by any one of the reproduction process terminals 20a through 20n;

Fig. 18 illustrates a CRT screen in the middle of execution of the reproduction specification process of step S12;

Figs. 19A through 19C are diagrams illustrating process information, "Trapping", "Outline", and "Overprinting", respectively;

Fig. 20 is a flowchart showing the final data output process at step S17 of Fig. 2 executed by any one of the reproduction process terminals 20a through 20n; and

Fig. 21 illustrates a CRT screen after execution of the final data output process of step S17.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Reproduction process system 10 (Fig. 1) is constituted as a local area network (hereinafter referred to as LAN) and includes input scanner 14 for scanning image data of a photographic original, output scanner 16 for recording a final composite image on a photosensitive film, data management device 18 for storing and managing a variety of data, and a plurality of reproduction process terminals 20a through 20n, which are connected with one another via a transmitting channel 12. A typical example of the LAN used here is Ethernet (registered trade mark owned by Xerox). Although only first through third reproduction process terminals 20a through 20c are illustrated in Fig. 1, the reproduction process system 10 may include any number of reproduction process terminals.

Each of the reproduction process terminals 20a through 20c includes a work station 22 as a central constituent and a plurality of peripheral units including a keyboard 24, a mouse 25, a tablet 26, a color CRT (cathode ray tube) display 27, a flexible disk drive 28, and a hard disk unit 29. Each work station 22 (see terminal 20b) is constructed of a micro-computer including a CPU (central processing unit) 22a, a ROM (read only memory) 22b, and a RAM (random access memory) 22c. The second reproduction process terminal 20b includes a plane input scanner 30 in place of the tablet 26.

The data management device 18 includes a magnetic disk unit 32 for storing a variety of data including picture data, linework data, and page layout data and a data management unit 33 for managing input and output of data in and from the magnetic disk unit 32. The data management unit 33 manages and stores picture data input through scanning, with the input scanner 14, a variety of data generated with the reproduction process terminals 20a through 20c and stored in the magnetic disk unit 32.

A series of reproduction-related processes executed by the reproduction process system 10 of Fig. 1 are described according to the flowchart of Fig. 2. At steps S1 through S3, original checking, reproduction schedule adjustment, and reproduction process design are executed manually. At step S1, the operator checks an original and a layout sheet previously prepared as well as a process specification. At step S2, the operator checks a due date for reproduction process and adjusts a reproduction schedule accordingly. At step S3, the operator grasps contents of each reproduction process and makes detailed work instructions according to the reproduction schedule.

At step S4, a process manager supervising work for the entire reproduction process performs job management which includes electronic processing of information representing contents of reproduction (for example, a job name, a page number, and a signature pattern) and a due date determined at steps S1 through S3. The job management process of step S4 allows effective work control in a reproduction-related process so as to simplify operation required for each process worker. Details of the job management process executed at step S4 will be described later.

Input operations conducted for subsequent reproduction process are described according to steps S5 through S8. In a picture preparation process executed at step S5, a picture image included in a photographic original is prepared, and required input conditions, such as magnification and input angle, are determined. In a picture input process at step S6, the picture image in the photographic original is scanned with input scanner 14. In a linework input process at step S7, a linework image including letters or illustrations is scanned by the second reproduction process terminal 20b, using plane input scanner 30. Picture data and linework data thus input are stored in the magnetic disk unit 32 of the data management device 18. In a page layout input process at step S8, contents specified in a mechanical form are traced and inputted by the first reproduction process terminal 20a using tablet 26, as page layout data. The page layout data thus generated is stored in the magnetic disk unit 32 of the data management device 18.

The page layout data represents positions of image parts including picture data and linework data in one page. Fig. 3 illustrates conceptually a structure of page layout data PLD that corresponds to a certain page that includes a header area HD and a plurality of image part areas IP1, IP2, ..., IPn (n: arbitrary integer) corresponding to image parts mounted on the certain page. The header area HD further includes page number data PN and page size data WXp and WYp. The respective image part areas IP1, IP2, ..., IPn include image part name data ID1 through IDn each showing identification of an image part mounted on the certain page, off-set values OF1 through OFn each showing a position of a mask area on the certain page, and mask size data WX1 through WXn, WY1 through WYn each representing dimensions of a mask area.

Fig. 4 shows a page image corresponding to the page layout data PLD of Fig. 3. A picture of a first image part ID1 representing a mountain is allocated to a first mask area defined by a first off-set value OF1 and first mask size data WX1, WY1 while another picture of a second image part ID2 representing the sea is allocated to a second mask area defined by a second off-set value OF2 and second mask size data WX2, WY2. Linework of an

n-th image part IDn representing a series of letters "SUMMER" is further allocated to an n-th mask area defined by an n-th off-set value OFn and n-th mask size data WXn, WYn.

At step S9, the process manager lays out picture data, linework data, and page layout data stored in the magnetic disk unit 32 on a certain page corresponding to the page number specified by the job management process of step S4 with any one of the reproduction process terminals 20a through 20c. The job and page layout process of step S9 allows effective data management in reproduction-related processes so as to simplify operations required for each process worker. Details of the layout process executed at step S9 will be described later.

Steps S10 through S17 described below are conducted by each process worker in the reproduction-related process.

In picture processing at step S10 and creation of a cutout mask at step S11, a list of picture data or page layout data is displayed on the color CRT display 27 by specifying the job name and the page number with any one of the reproduction process terminals 20a through 20c. The list of picture data shows a file name of each data. When a process worker specifies a desired picture image in the list of picture data, the desired picture image is enlarged and displayed on the color CRT display 27. The process worker conducts retouching and cutout of the desired picture image displayed. A list of picture data or page layout data is displayed on the color CRT display 27 only by specifying the job name and the page number since page layout data, picture data and linework data are allocated to each job and page at step S9. In an alternative structure, arbitrary picture data is directly input from the magnetic disk unit 32 without specification of the job name and the page number.

In the reproduction specification process executed at step S12, page construction data including page layout data, picture data, and linework data are displayed on the color CRT display 27 by specifying the job name and the page number with any one of the reproduction process terminals 20a through 20c, and the process worker allocates process information such as "Trapping", "Outline", or "Overprinting" to image part data in the designated page through interaction with the CRT display 27. In an alternative structure, process information is allocated to arbitrary picture data directly input from the magnetic disk unit 32. Details of the reproduction specification process at step S12 will be described later.

In a page make-up process at step S13, page layout data, picture data, and linework data are composed for page make-up. In a proof-reading process at step S14, layout and colors are checked according to the assembled composite data. The program then goes to step S15 at which it is determined whether no problem is found as a result of proof-reading. If the proof-reading indicates some correction is required, the program goes to step S16 at which the reproduction process is returned for correction to the step where an error is made.

When the proof-reading indicates no correction at step S15 or after completion of the correction at step S16, the program proceeds to step S17 at which final composite data is output to the output scanner 16, so that a resultant image is recorded on a photosensitive film. After completion of the series of reproduction process steps, the program exits from the routine. Details of the final data output at step S17 will be described later.

Details of the job management process at step S4 are described according to the flowchart of Fig. 5. Step S4 is executed with any one of the reproduction process terminals 20a through 20c. The CPU 22a of an arbitrary reproduction process terminal executes the following process in response to selection by the process manager. At step S110, the CPU 22a displays a job information window W1 having a title of "Job Create" (see Fig. 6) on a screen of the color CRT display 27 (hereinafter referred to as CRT screen). The job information window W1 includes a date-of-creation box C1, a job name box C2, an order number box C3, a date-of-completion box C4, an output scanner identification box C5, a signature pattern box C6, and a number of folders box C7.

The program then goes to step S120 at which data are input into the boxes C1 through C7 of the job information window W1 displayed on the CRT screen. Data corresponding to the date-of-creation box C1 is automatically input by a timer unit incorporated in the work station 22. The process manager inputs data for display at job name box C2, order number box C3, and date-of-completion box C4 by operating the mouse 25 to move a pointer PT to the respective boxes C2 through C4 on the CRT screen and inputting required characters through the keyboard 24. The job name written in the job name box C2 specifies a target print of the reproduction process, for example, "Book 1". Contents confirmed at the original check process of step S1 and the schedule adjustment process of step S2 are input into the order number box C3 and the date-of-completion box C4.

Data corresponding to the output scanner identification box C5 is input as described below. The process manager operates the mouse 25 to click a switch SWC5 displayed immediately before the output scanner identification box C5 to open an output scanner identification menu MN1 shown in Fig. 7. The process manager then clicks the mouse

25 to select a name of the output scanner 16 out of a plurality of scanner names displayed in the output scanner identification menu MN1. The process manager may identify the name of the output scanner 16 according to the printing size shown in the output scanner identification menu MN1 instead of selecting a machine type.

A page signature pattern on a photosensitive film corresponding to a plate surface is written in the signature pattern box C6 in the following manner. The process manager operates the mouse 25 to click a switch SWC6 displayed immediately before the signature pattern box C6 to open a signature pattern menu MN2 shown in Fig. 8. The process manager then clicks the mouse 25 to select a desirable signature pattern out of a plurality of signature patterns displayed in the signature pattern menu MN2. The signature pattern menu MN2 shown in Fig. 8 includes, for example, a signature pattern expressed as "A4-4Pages", which means that four A4 pages are mounted on a photosensitive film.

Data in the number of folders box C7 represents a folding number (a unit of sheets printed at once) of a print specified by the job name input in the job name box C2. The process manager operates the mouse 25 to move the pointer PT to the number of folders box C7 on the CRT screen and inputs a corresponding figure through the keyboard 24.

A recording form on photosensitive films is determined according to a signature pattern input in the signature pattern box C6 and a number of folders written in the number of folders box C7. This process is described hereinafter in detail, based on an example in which the signature pattern is "A4-4 Pages" representing four A4 pages mounted on a photosensitive film, and the number of folders is set equal to four. Four photosensitive films (two front films and two back films) each having four A4 pages mounted thereon form a quarto sixteen-page print as shown in Fig. 9. A sixteen-page print is completed by allocating four A4 pages to each of four films "1FRONT", "1BACK", "2FRONT", and "2BACK" as shown in Fig. 10. Required data are input in the signature pattern box C6 and the number of folders box C7 to realize a desirable recording form.

After data input into the boxes C1 through C7 on the job information window W1 at step S120, the program goes to step S130 at which a click of an "OK" button disposed on the lower portion of the job information window W1 closes the job information window W1.

After execution of step S130, the program proceeds to step S140 at which page list display window W2 (Fig. 11) is shown on color CRT display 27. The page list display window W2 schematically shows the recording form of the photosensitive films described above which includes a title "Page List" and first and second sub-windows W21 and W22. The first sub-window W21 shows folders FDR1 through FDR4 corresponding to the number of folders input in the number of folders box C7 of the job information window W1. The second sub-window W22 visually shows a signature pattern input in signature pattern box C6. Each of the folders FDR1 through FDR4 displayed on the folder-display first sub-window W21 corresponds to the signature pattern-display second sub-window W22. When one of the folders FDR1 through FDR4 is selected in the folder-display first sub-window W21, contents in a photosensitive film corresponding to the selected folder FDR1, FDR2, FDR3, or FDR4 are displayed in the signature pattern-display second sub-window W22.

More particularly, when a quarto sixteen-page print is prepared as described above, first through fourth folders FDR1 through FDR4, corresponding to four films "1FRONT", "1BACK", "2FRONT", and "2BACK" shown in Fig. 10, are displayed in the folder-display first sub-window W21. When the first folder FDR1 corresponding to the "1FRONT" film is selected, first through fourth icons ICN1 through ICN4, corresponding to the respective fifth, fourth, eighth, and first pages, are shown in the signature pattern-display second sub-window W22.

A typical structure for data stored in magnetic disk unit 32 is described in detail according to the schematic diagram of Fig. 12. Magnetic disk unit 32 includes a plurality of directories each having a job name input in the job name box C2, for example, "Book 1". Each directory with a job name further includes a plurality of sub-directories each having a number of pages determined according to the signature pattern and the number of folders, for example, "Page 1", "Page 2", ..., "Page 16". The directories with job names are created after data input into the boxes C1 through C7 in the job information window W1 (Fig. 6) at step S120 and closing of the window W1 at step S130. After execution of step S140, the job management process at step S4 of Fig. 2 is concluded.

A management information table TBL1 and one or a plurality of page information tables TBL2 shown in Fig. 13 are created through execution of the job management process. The management information table TBL1 includes the date of creation, the job name, the order number, the due date, the name of the output scanner, the signature pattern, and the number of folders. The page information table TBL2 is created for each page and includes data representing the page number, the number of constituents of the page, and the general attribute of the page. The management information table is linked to the plurality of page

information tables TBL2 according to a predetermined rule. As shown in Fig. 13, the management information table TBL1 is connected to a first page information table TBL2(1) for the first page, which is further linked to a second page information table TBL2(2) for the second page. In this manner, the management information table TBL1 is successively linked to a plurality of page information tables TBL2(1) through TBL2(n) (n: arbitrary integer) in this sequence. Since these tables TBL1 and TBL2-(1) through TBL2(n) are linked via pointer data, modification of the pointer data readily allows supplement and elimination of a page information table TBL2(k) (k: arbitrary integer). These tables TBL1 and TBL2(1) through TBL2(n) are stored in the magnetic disk unit 32.

As described above, job information is newly set and determined according to the job management routine of Fig. 5. Existing job information may be changed later by selecting a required box from boxes C1 through C7 in job information window W1 and inputting new data in the box.

Details of the job and page layout routine executed at step S9 of Fig. 2 are described according to the flowchart of Fig. 14.

At step S9, required working data are extracted from the picture data, the linework data, and the page layout data previously stored in the magnetic disk unit 32 through execution of the picture input process of step S6, the linework input process of step S7, and the page layout input process of step S8, and allocated to the job and the page previously determined through execution of the job management process of step S4. The process at step S9 is executed by any one of the reproduction process terminals 20a through 20c and includes the steps shown in the flowchart of Fig. 14. At step S400, the page list display window W2 (Fig. 11) is displayed on the color CRT display 27. The signature pattern-display second sub-window W22 of the page list display window W2 includes the first through fourth icons ICN1 through ICN4 corresponding to the folder selected by the process manager. An HD window W3 shown in Fig. 15 is then displayed on the color CRT display 27 at step S410. The HD window W3 includes a plurality of icons representing the page layout data, the picture data, and the linework data stored in the magnetic disk unit 32 and output by the data management unit 33. In the HD window W3, each icon, for example, ICN11 or ICN12, includes data type information to discriminate picture data, linework data, and page layout data from one another.

At step S420, working data is allocated to a target page in response to operation of the mouse 25 by the process manager who operates the mouse 25 to move the pointer PT to a desirable icon out of the icons ICN11, ICN12, ..., and ICN1n in the HD window W3 on the CRT screen and select the desirable icon by a click of the mouse 25. The process manager then moves the desirable icon to a target icon representing the target page in the signature pattern-display second sub-window W22. In the example of Fig. 15, the first icon ICN11 representing a file of page layout data (file name = AAA.PG) in the HD window W3 is moved to the second icon ICN2 corresponding to the fourth page in the signature pattern-display second sub-window W22. When a file of page layout data is specified in the HD window W3, required picture data and linework data may be previously set in the selected page layout data. In this case, specification of picture data and linework data is not required separately.

At step S430, data in a file corresponding to the desirable icon in the HD window W3 specified at step S420 are retrieved and moved to a sub-directory in the magnetic disk unit 32, which corresponds to the target icon specified in the signature pattern-display second sub-window W22. After execution of step S420 for the example shown in Fig. 15, the directory structure in the magnetic disk unit 32 is changed from that shown in Fig. 12 to that shown in Fig. 16. In this example shown in Fig. 16, the file AAA.PG of page layout data is stored in a page number sub-directory "Page 4" corresponding to the fourth page in a job-name directory "Book 1". Picture data A1.CT and A2.CT previously set in the page layout data file AAA.PG are simultaneously stored in the sub-directory "Page 4". When linework data is set in the page layout data file AAA.PG, the sub-directory "Page 4" also stores the linework data (not shown in Fig. 16).

After execution of step S430, the program goes to step S440 at which the name of the specified data file is displayed on the target icon in the signature pattern-display second sub-window W22. After checking allocation of the specified data file to the target page, the layout process at step S9 is concluded. Details of the reproduction specification process executed at step S12 of Fig. 2 with any one of the reproduction process terminals 20a through 20c are described according to the flowchart of Fig. 17.

The process worker operates the reproduction process system to display a JOB window W4 (Figs. 18 and 21) showing contents in a first hierarchy, that is, a plurality of job-name directories stored in the magnetic disk unit 32 on the CRT screen. In the JOB window W4, each job name is shown corresponding to an Icon ICN21, ICN22, ..., or ICN2n (n: arbitrary integer). The process worker then selects one of the icons ICN21, ICN22, ..., ICN2n in the JOB window W4. In response to selection of one icon by the process worker, a specific job name corresponding to the selected

icon, for example, ICN21, is read at step S210.

At step S220, a management information table TBL1 and page information tables TBL2 corresponding to the specific job name are read from magnetic disk unit 32. The program then goes to step S230 at which a page list display window W2 is displayed on the color CRT display 27 based on the management information table TBL1 and the page information tables TBL2 as shown in Fig. 13.

At step S240, one of page icons ICN1 through ICN4 in a signature pattern-display second sub-window W22 of the page list display window W2 is selected for page editing. The processing at step S240 is executed in response to operation of the mouse 25 by the process worker. The process worker operates the mouse 25 to move the pointer PT to a desirable icon corresponding to a target page for reproduction specification out of the page icons ICN1 through ICN4 in the second sub-window W22 on the CRT screen and select the desirable icon, for example, ICN2, by a click of the mouse 25. The process worker then moves the selected page icon ICN2 to an icon ICN31 representing page editing in a tool window W5 (Fig. 18) that includes a plurality of tools. Page editing is thus specified for the target page.

At step S250, the target page selected at step S240 is displayed on the CRT screen. That is, a page number sub-directory is extracted from a plurality of sub-directories in the magnetic disk unit 32 (see Fig. 16) based on the job name read at step S210 and the page number selected at step S240. Page layout data and image data stored in the sub-directory are then read out, and the target page corresponding to the page layout data is displayed on the CRT screen.

The program then goes to step S260 at which process information such as "Trapping", "Outline", or "Overprinting" is set for a specific image part in the target page. The "Trapping" process (Figs. 19-(a)) expands an overlapped area IP3 between two image parts IP1 and IP2 respectively including one or a plurality of pictures, characters, or the like. Fig. 19b makes a certain width of margin IP12 around a character or picture contour of an image part IP11. The "Overprinting" process (Fig. 19c) overlays black characters IP21 upon a background color UD. Specification of such process information is executed in response to operation of the mouse 25 by the process worker. After specification of process information, the reproduction specification process of step S12 is concluded.

Details of the final data output process executed at step S17 of Fig. 2 with any one of the reproduction process terminals 20a through 20c are described according to the flowchart of Fig. 20.

At step S310, the JOB window W4 showing contents of the magnetic disk unit 32 is displayed on the CRT screen as shown in Fig. 21. A specific icon, for example, ICN21, is selected out of the icons ICN21 through ICN2n each corresponding to a job name in the JOB window W4, and data under a job name corresponding to the specific icon ICN21 are then specified for outputting process. The processing at step S320 is executed in response to operation of the mouse 25 by the process worker. The process worker operates the mouse 25 to move the pointer PT to a specific icon corresponding to a desirable job name out of the icons ICN21 through ICN2n in the JOB window W4 on the CRT screen and select the specific icon, for example, ICN21, by a click of the mouse 25. The process worker then moves the selected icon ICN21 to an icon ICN32 representing data output in an output window W6 as shown in Fig. 21. The output window W6 includes a plurality of output-related instructions. Output of data under the desirable job name is thus specified.

At step S330, target pages of data specified by the desirable job name are recorded on photosensitive films. More concretely, a job name directory is extracted from a plurality of directories in the magnetic disk unit 32 (see Fig. 16) based on the job name specified at step S320. Page layout data and image data of each page stored in the directory are then read out, and the target pages corresponding to the page layout data are output to the output scanner 16. In the example of Fig. 21, all pages under the job name "Book 1" are recorded on the photosensitive films. In the job name "Book 1", each plate Y (yellow), M (magenta), C (cyan), or K (black) consists of four photosensitive films as described above, and thereby data corresponding to the total of 16 (=4x4) photosensitive films are output at step S330.

Page layout on each photosensitive film is previously set as a signature pattern at the job management process of step S4 of Fig. 2. Page layout data, picture data, and linework data for all the target pages are thus allocated and output to the photosensitive film based on the signature pattern. After execution of step S330, the final data output process of step S17 is concluded.

As described above, in the reproduction process system 10 of the embodiment, the magnetic disk unit 32 includes a plurality of job name directories, for example, "¥Book 1", "¥Book 2", and "¥Magazine", each having a plurality of page name sub-directories, for example, "Page 1", "Page 2", as shown in Fig. 16. Each page number sub-directory stores page layout data, for example, AAA.PG representing a page structure specified by the page number and picture data and/or linework data, for example, A1.CT and A2.CT.

When the process worker specifies a job name and a page number, a target page corresponding

to page layout data in a page number sub-directory determined by the job name and the page number is automatically displayed on the CRT screen. This frees the process worker from making troublesome selection and specification of page structure data including picture data, linework data, and page layout data, thus improving the working efficiency.

In the final data output process of step S17, when the process worker specifies a desirable job name, page layout data, picture data, and linework data hierarchically contained under the job name are automatically read out. In the system of the embodiment, a signature pattern for each photosensitive film is set in the job management process of step S4 in Fig. 2. When the process worker specifies a job name, all pages specified by the job name are recorded on the photosensitive films based on the signature pattern. This further improves working efficiency.

There may be many changes, modifications, and alterations without departing from the scope or spirit of essential characteristics of this invention, and it is thereby clearly understood that the above described embodiment is only illustrative and not restrictive in any sense. The spirit and scope of the present invention is only limited by the terms of the appended claims.

The features disclosed in the foregoing description, in the following claims and/or in the accompanying drawings may, both separately and in any combination thereof, be material for realising the invention in diverse forms thereof.

Claims

1. A reproduction process apparatus for executing a variety of reproduction-related processes, comprising: a memory for storing page construction data including page layout data and image part data, said page layout data representing positions of a plurality of image parts laid on one page, said image part data representing said plurality of image parts; a working memory for storing data used in execution of each of said variety of reproduction-related processes; said apparatus characterized by comprising:

   a hierarchical memory for storing first hierarchy data including a plurality of job names each representing a print, second hierarchy data including a plurality of page numbers, and third hierarchy data including a plurality of names of said page construction data, each of said plurality of job names having at least one page number as said second hierarchy data, each of said plurality of page numbers having at least one name of said page construction data as said third hierarchy data;

   page number specification means for selecting a specific page number from said plurality of page numbers; and

   data transfer means for comparing said specific page number with said second hierarchy data to extract at least one name of said page construction data corresponding to said specific page number from said third hierarchy data, and transferring said page construction data specified by said at least one name of said page construction data from said memory to said working memory.

2. A reproduction process apparatus in accordance with claim 1, further comprising:

   a plurality of process means for individually executing said variety of reproduction-related processes;

   process specification means for specifying a certain process; and

   selection means for selecting specific process means for executing said certain process from said plurality of process means and activating said specific process means to execute said certain process according to data stored in said working memory.

3. A reproduction process apparatus in accordance with claim 2, wherein said plurality of process means comprises process information specification means for setting desirable process information, said process information including first, second and third process titles, said first process title indicating a process of producing an overlapping area between two image parts, said second process title indicating a process of making a margin of a predetermined width around a contour of an image part, said third process title indicating a process of printing a black character over a background.

4. A reproduction process apparatus in accordance with claim 1, further comprising:

   picture image scanning means for scanning at least one picture image in an original to capture picture data;

   linework image scanning means for scanning at least one linework to capture linework data; and

   layout data input means for tracing a line in a mechanical layout sheet to input said page layout data.

5. A reproduction process apparatus in accordance with claim 1, further comprising:

   icon display means for displaying each of said plurality of page numbers as an icon; and

wherein said page number specification means further comprises icon movement monitoring means for monitoring a movement of said icon moved by operator.

6. A reproduction process apparatus for executing a variety of reproduction-related processes, comprising: a memory for storing page construction data including page layout data and image part data, said page layout data representing positions of a plurality of image parts laid on one page, said image part data representing said plurality of image parts; a working memory for storing data used in execution of each of said variety of reproduction-related processes; said apparatus characterized by comprising:

a hierarchical memory for storing first hierarchy data including a plurality of job names each representing a print, second hierarchy data including a plurality of page numbers, and third hierarchy data including a plurality of names of said page construction data, each of said plurality of job names having at least one page number as said second hierarchy data, each of said plurality of page numbers having at least one name of said page construction data as said third hierarchy data;

job name specification means for selecting a specific job name out of said plurality of job names; and

data transfer means for comparing said specific job name with said first hierarchy data to extract all names of said page construction data corresponding to said specific job name from said second hierarchy data, and said third hierarchy data and transferring said page construction data specified by said all names of said page construction data from said memory to said working memory.

7. A reproduction process apparatus in accordance with claim 6, further comprising:

a plurality of process means for individually executing said variety of reproduction-related processes;

process specification means for specifying a certain process; and

selection means for selecting specific process means for executing said certain process from said plurality of process means and activating said specific process means to execute said certain process according to data stored in said working memory.

8. A reproduction process apparatus in accordance with claim 7, wherein said plurality of process means comprises process information specification means for setting desirable process information, said process information including first, second and third process titles, said first process title indicating a process of producing an overlapping area between two image parts, said second process title indicating a process of making a margin of a predetermined width around a contour of an image part, said third process title indicating a process of printing a black character over a background.

9. A reproduction process apparatus in accordance with claim 7, further comprising:

pattern memory for storing a signature pattern representing a page signature pattern on each printing plate; and

wherein said plurality of process means comprises output means for outputting said page construction data according to signature data;

said output means further comprising signature data layout means for allocating said page construction data corresponding to said all names transferred to said working memory to said signature data for each page according to said signature pattern.

10. A reproduction process apparatus in accordance with claim 6, further comprising:

picture image scanning means for scanning at least one picture image in an original to capture picture data;

linework image scanning means for scanning at least one linework to capture linework data; and

layout data input means for tracing a line in a mechanical layout sheet to input said page layout data.

11. A reproduction process apparatus in accordance with claim 6, further comprising:

icon display means for displaying each of said plurality of job names as an icon; and

wherein said job name specification means further comprises icon movement monitoring means for monitoring a movement of said icon moved by the operator.

12. A method of executing a variety of reproduction-related processes, comprising: step (a) of storing page construction data including page layout data and image part data, said page layout data representing positions of a plurality of image parts laid on one page, said image part data representing said plurality of image parts; step (b) of preparing a working memory for storing data used in execution of each of

said variety of reproduction-related processes; said method characterized by comprising:

step (c) of storing first hierarchy data including a plurality of job names each representing a print, second hierarchy data including a plurality of page numbers, and third hierarchy data including a plurality of names of said page construction data, each of said plurality of job names having at least one page number as said second hierarchy data, each of said plurality of page numbers having at least one name of said page construction data as said third hierarchy data;

step (d) of selecting a specific page number out of said plurality of page numbers; and

step (e) of comparing said specific page number with said second hierarchy data to extract at least one name of said page construction data corresponding to said specific page number from said third hierarchy data, and transferring said page construction data specified by said at least one name of said page construction data to said working memory.

13. A method in accordance with claim 12, further comprising:

step (f) of preparing a plurality of process units for individually executing said variety of reproduction-related processes;

step (g) of specifying a certain process; and

step (h) of selecting a specific process unit for executing said certain process out of said plurality of process units and activating said specific process unit to execute said certain process according to data stored in said working memory.

14. A method in accordance with claim 13, wherein said step (f) further comprises:

step (f-1) of preparing a process information specification unit for setting desirable process information, said process information including first through third process titles, said first process title indicating a process of producing an overlapping area between two image parts, said second process title indicating a process of making a margin of a predetermined width around a contour of an image part, said third process title indicating a process of printing a black character over a background.

15. A method in accordance with claim 12, further comprising:

step (i) of scanning at least one picture images in an original to capture picture data;

step (j) of scanning at least one linework to capture linework data; and

step (k) of tracing a line in a mechanical layout sheet to input said page layout data.

16. A method in accordance with claim 12, further comprising:

step (l) of displaying each of said plurality of page numbers as an icon; wherein said step (d) further comprises:

step (d-1) of monitoring a movement of said icon moved by the operator.

17. A method of executing a variety of reproduction-related processes, comprising: step (a) of storing page construction data including page layout data and image part data, said page layout data representing positions of a plurality of image parts laid on one page, said image part data representing said plurality of image parts; step (b) of preparing a working memory for storing data used in execution of each of said variety of reproduction-related processes; said method characterized by comprising:

step (c) of storing first hierarchy data including a plurality of job names each representing a print, second hierarchy data including a plurality of page numbers, and third hierarchy data including a plurality of names of said page construction data, each of said plurality of job names having at least one page number as said second hierarchy data, each of said plurality of page numbers having at least one name of said page construction data as said third hierarchy data;

step (d) of selecting a specific job name out of said plurality of job names; and

step (e) of comparing said specific job name with said first hierarchy data to extract all names of said page construction data corresponding to said specific job name from said second hierarchy data, and said third hierarchy data, and transferring said page construction data specified by said all names of said page construction data to said working memory.

18. A method in accordance with claim 17, further comprising:

step (f) of preparing a plurality of process units for individually executing said variety of reproduction-related processes;

step (g) specifying a certain process; and

step (h) selecting a specific process unit for executing said certain process out of said plurality of process units and activating said specific process unit to execute said certain process according to data stored in said working memory.

19. A method in accordance with claim 18, wherein said step (f) further comprises:

step (f-1) of preparing a process information specification unit for setting desirable process information, said process information including first, second and third process titles, said first process title indicating a process of producing an overlapping area between two image parts, said second process title indicating a process of making a margin of a predetermined width around a contour of an image part, said third process title indicating a process of printing a black character over a background.

20. A method in accordance with claim 18, further comprising:

step (i) storing a signature pattern representing a page signature pattern on each printing plate;

wherein said step (f) further comprises the step of:

step (j) preparing an output unit for outputting said page construction data according to signature data; said step (j) further comprising the step of:

step (j-1) of allocating all page construction data corresponding to said all names transferred to said working memory to said signature data for each page according to said signature pattern.

21. A method in accordance with claim 17, said method further comprising:

step (k) of scanning at least one picture images in an original to capture picture data;

step (l) of scanning at least one linework to capture linework data; and

step (m) of tracing a line in a mechanical layout sheet to input said page layout data.

22. A method in accordance with claim 17, further comprising:

step (n) of displaying each of said plurality of job names as an icon; wherein said step (d) further comprises:

step (d-1) of monitoring a movement of said icon moved by the operator.

Fig. 1

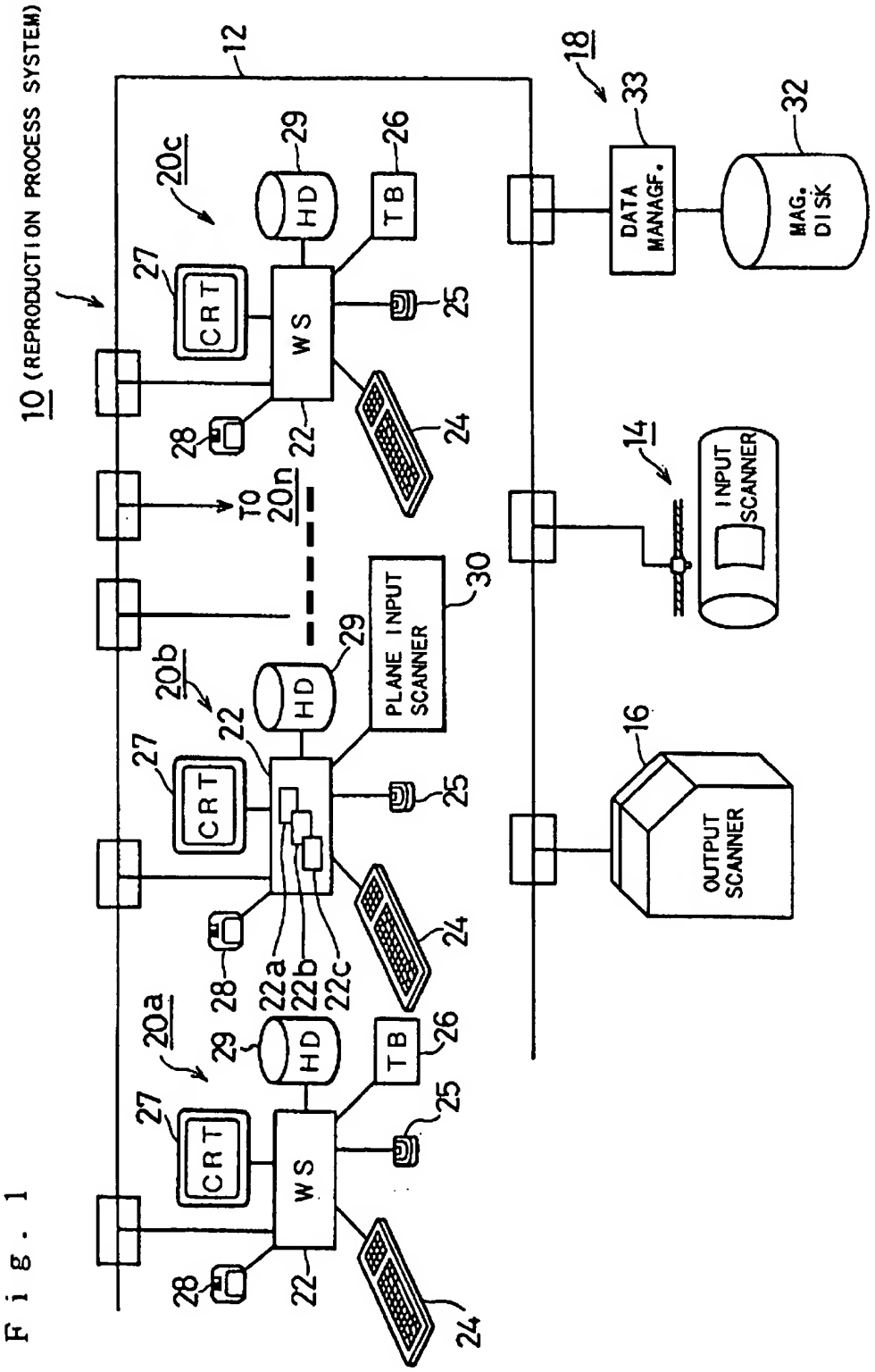

10 (REPRODUCTION PROCESS SYSTEM)
12
18
33
32
DATA MANAGF.
MAG. DISK
14
INPUT SCANNER
16
OUTPUT SCANNER
30
PLANE INPUT SCANNER
20a
20b
20c
20n
TO
CRT
WS
HD
TB
22
22a
22b
22c
24
25
26
27
28
29

Fig. 2

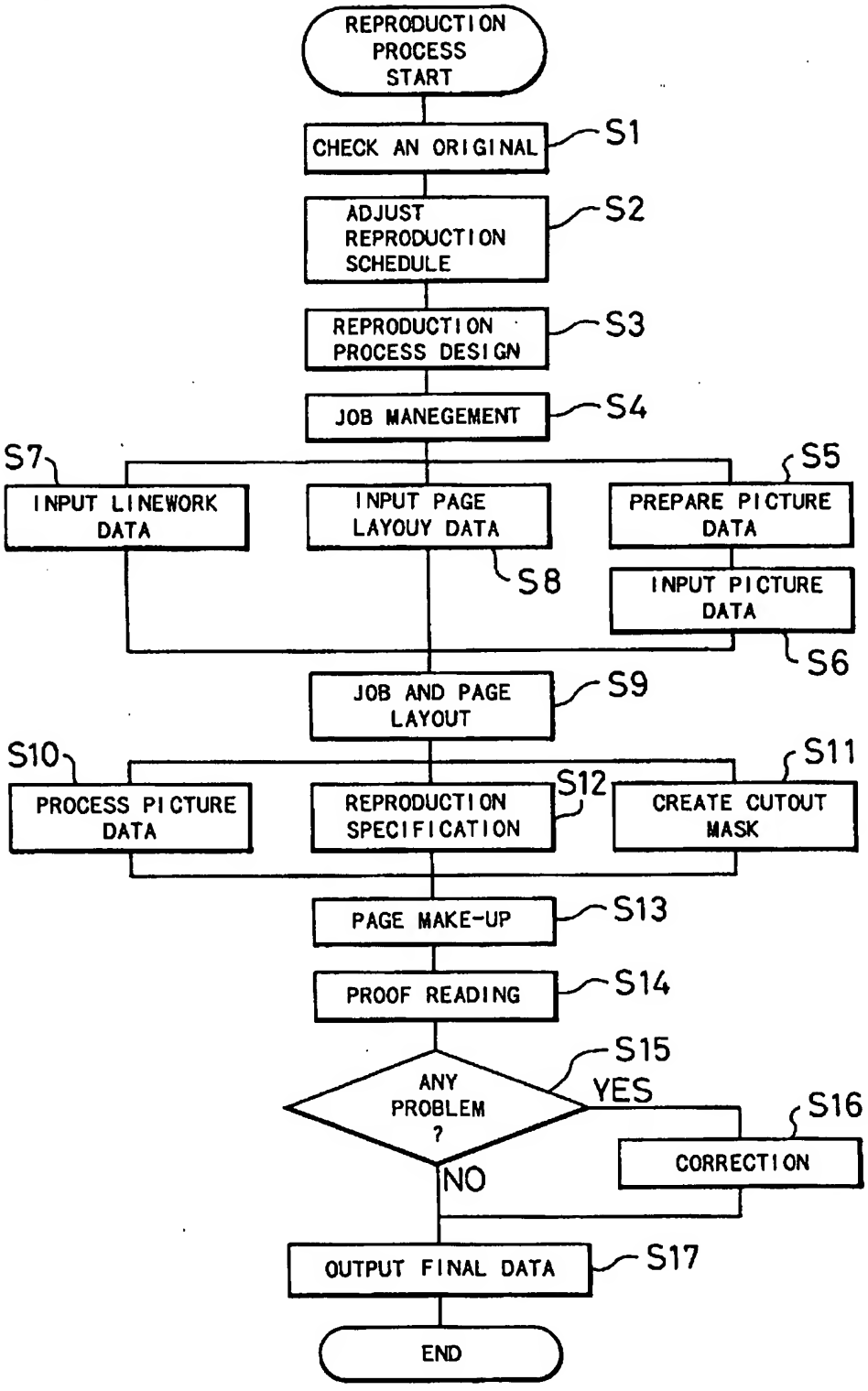

REPRODUCTION PROCESS START
CHECK AN ORIGINAL
S1
ADJUST REPRODUCTION SCHEDULE
S2
REPRODUCTION PROCESS DESIGN
S3
JOB MANEGEMENT
S4
S7
INPUT LINEWORK DATA
INPUT PAGE LAYOUY DATA
S8
S5
PREPARE PICTURE DATA
INPUT PICTURE DATA
S6
JOB AND PAGE LAYOUT
S9
S10
PROCESS PICTURE DATA
REPRODUCTION SPECIFICATION
S12
S11
CREATE CUTOUT MASK
PAGE MAKE-UP
S13
PROOF READING
S14
ANY PROBLEM ?
S15
YES
S16
CORRECTION
NO
OUTPUT FINAL DATA
S17
END

Fig. 3

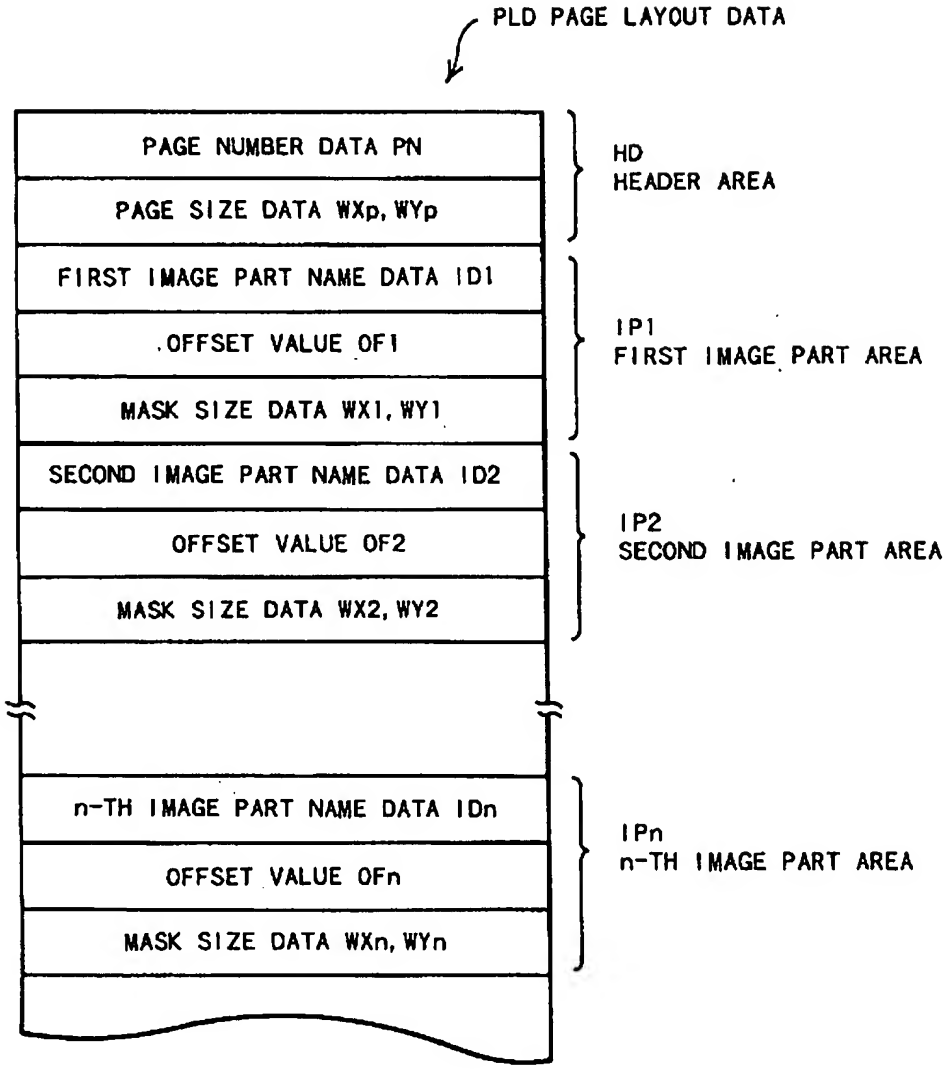

PLD PAGE LAYOUT DATA
PAGE NUMBER DATA PN
PAGE SIZE DATA WXp, WYp
HD
HEADER AREA
FIRST IMAGE PART NAME DATA ID1
OFFSET VALUE OF1
MASK SIZE DATA WX1, WY1
IP1
FIRST IMAGE PART AREA
SECOND IMAGE PART NAME DATA ID2
OFFSET VALUE OF2
MASK SIZE DATA WX2, WY2
IP2
SECOND IMAGE PART AREA
n-TH IMAGE PART NAME DATA IDn
OFFSET VALUE OFn
MASK SIZE DATA WXn, WYn
IPn
n-TH IMAGE PART AREA

Fig. 4

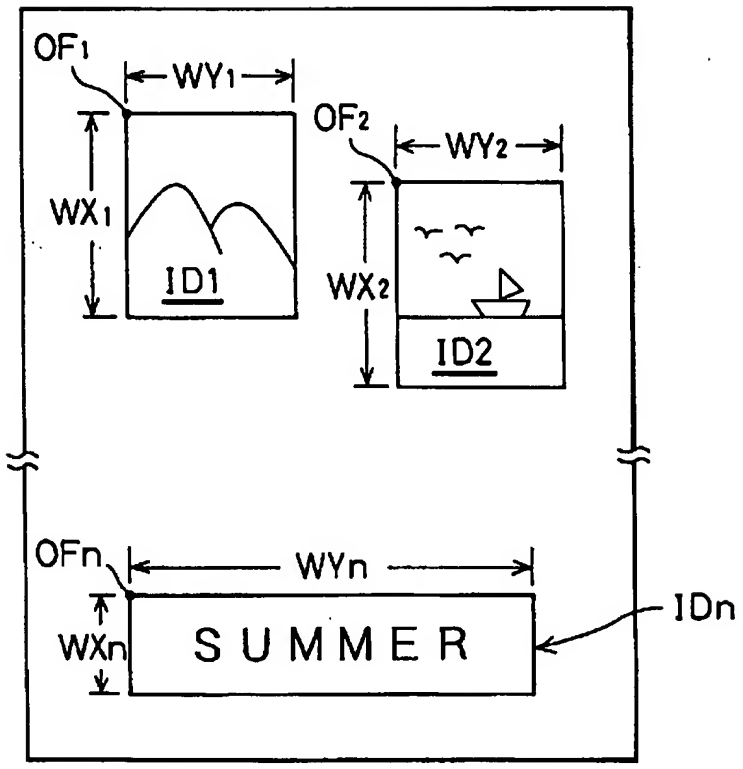


Fig. 5

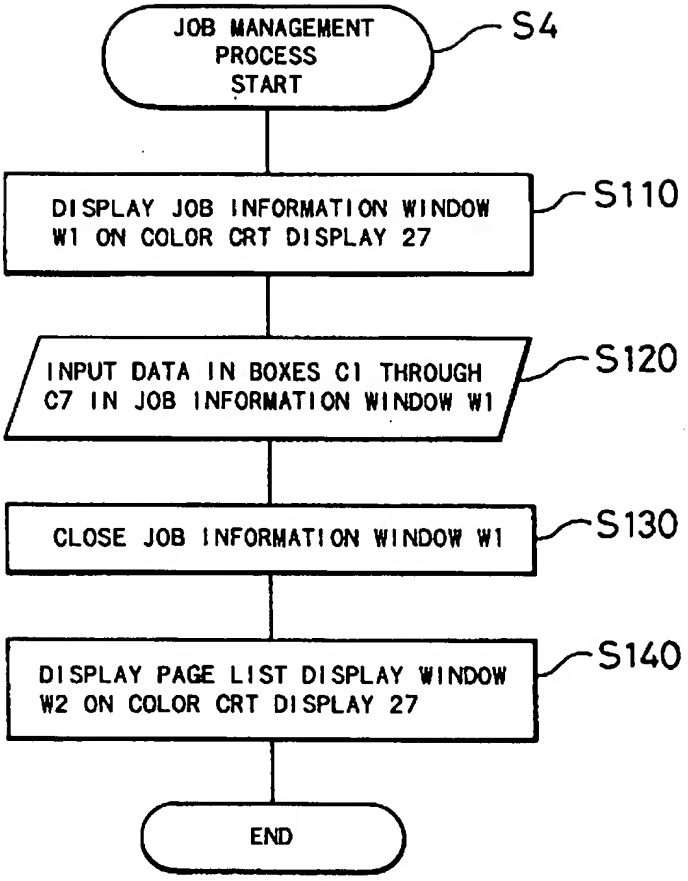

JOB MANAGEMENT PROCESS START
S4
DISPLAY JOB INFORMATION WINDOW W1 ON COLOR CRT DISPLAY 27
S110
INPUT DATA IN BOXES C1 THROUGH C7 IN JOB INFORMATION WINDOW W1
S120
CLOSE JOB INFORMATION WINDOW W1
S130
DISPLAY PAGE LIST DISPLAY WINDOW W2 ON COLOR CRT DISPLAY 27
S140
END

Fig. 6

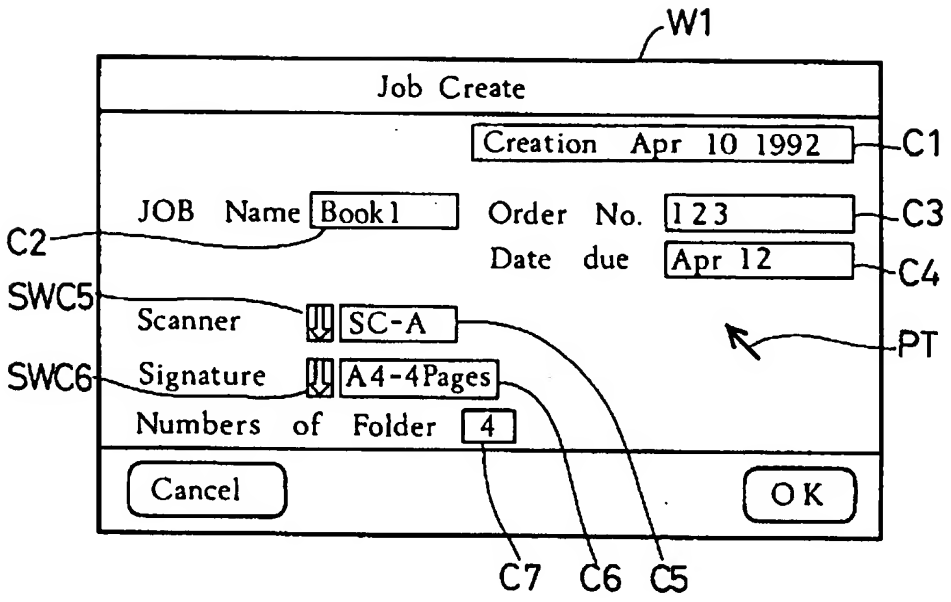


Fig. 7

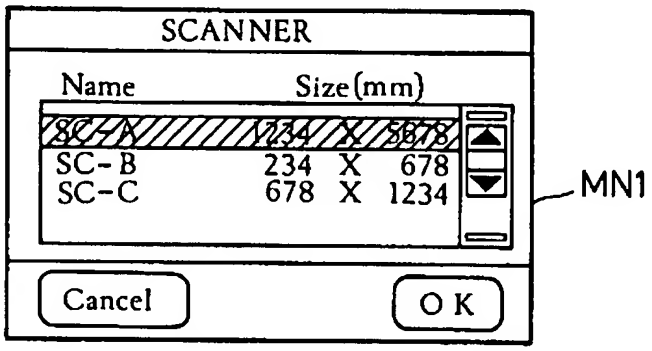


Fig. 8

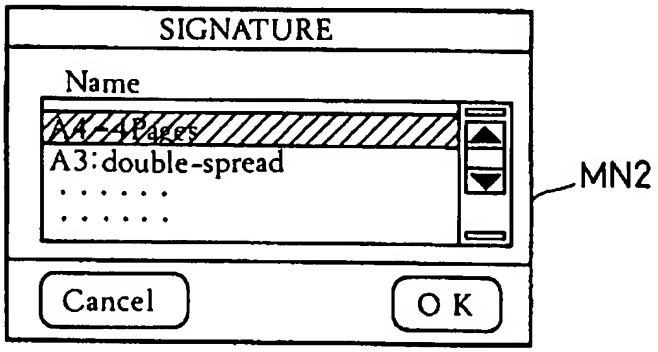


Fig. 9

QUARTO FOLDER

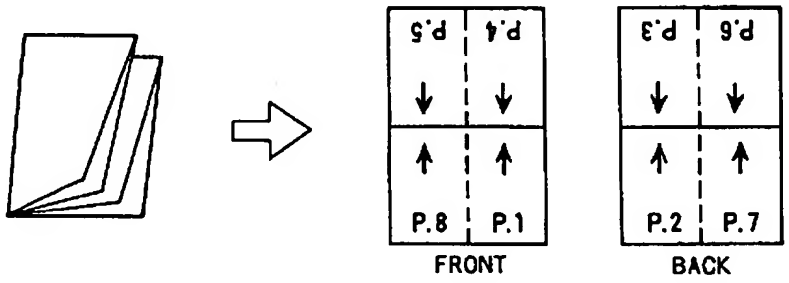


Fig. 10

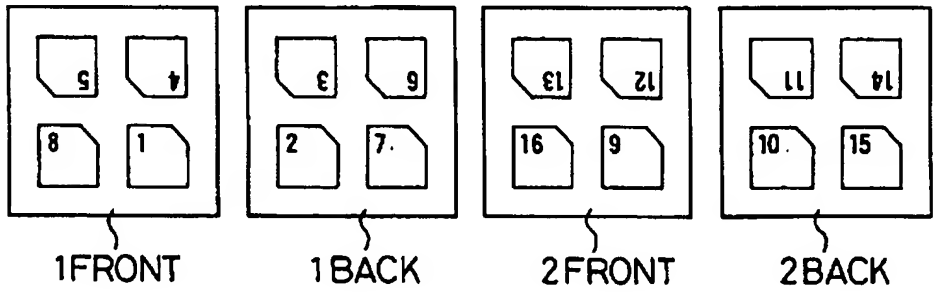


Fig. 11

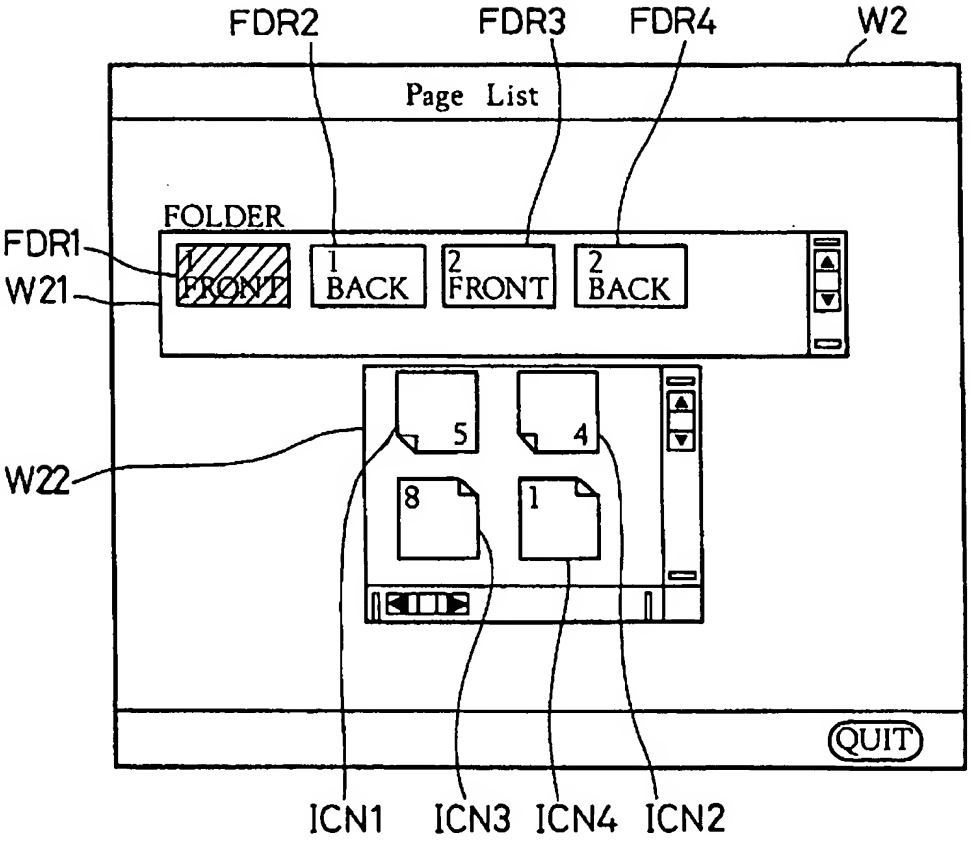

FDR2
FDR3
FDR4
W2
Page List
FOLDER
FDR1
W21
1 FRONT
1 BACK
2 FRONT
2 BACK
W22
5
4
8
1
QUIT
ICN1
ICN3
ICN4
ICN2

Fig. 12

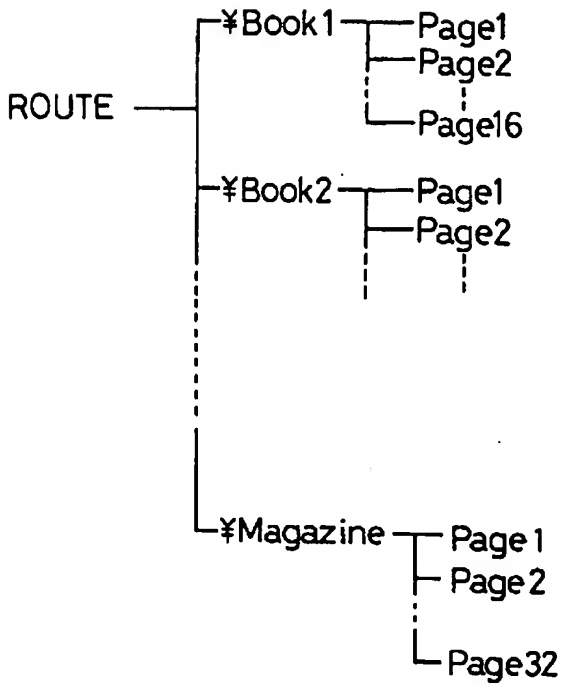

ROUTE
¥Book1
Page1
Page2
Page16
¥Book2
Page1
Page2
¥Magazine
Page1
Page2
Page32

Fig. 13

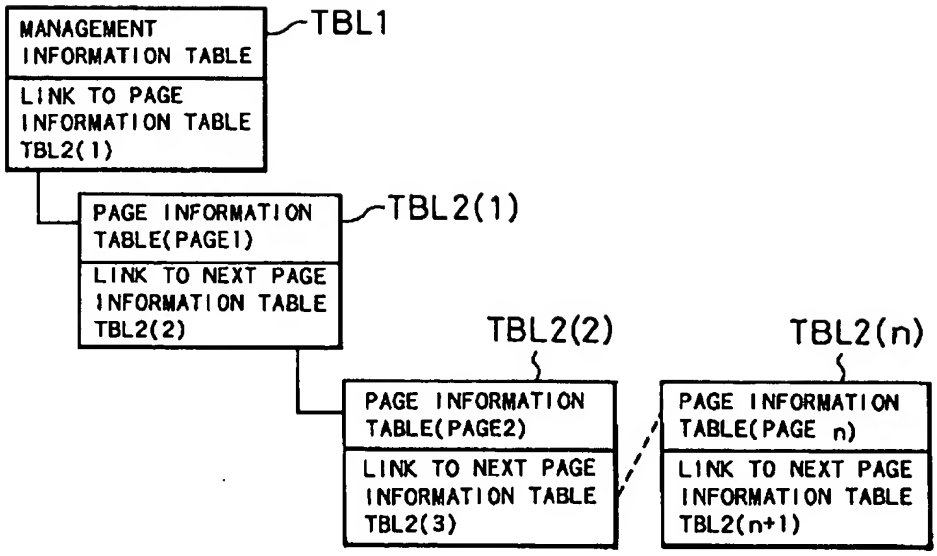

MANAGEMENT INFORMATION TABLE
LINK TO PAGE INFORMATION TABLE TBL2(1)
TBL1
PAGE INFORMATION TABLE(PAGE1)
LINK TO NEXT PAGE INFORMATION TABLE TBL2(2)
TBL2(1)
TBL2(2)
PAGE INFORMATION TABLE(PAGE2)
LINK TO NEXT PAGE INFORMATION TABLE TBL2(3)
TBL2(n)
PAGE INFORMATION TABLE(PAGE n)
LINK TO NEXT PAGE INFORMATION TABLE TBL2(n+1)

Fig. 14

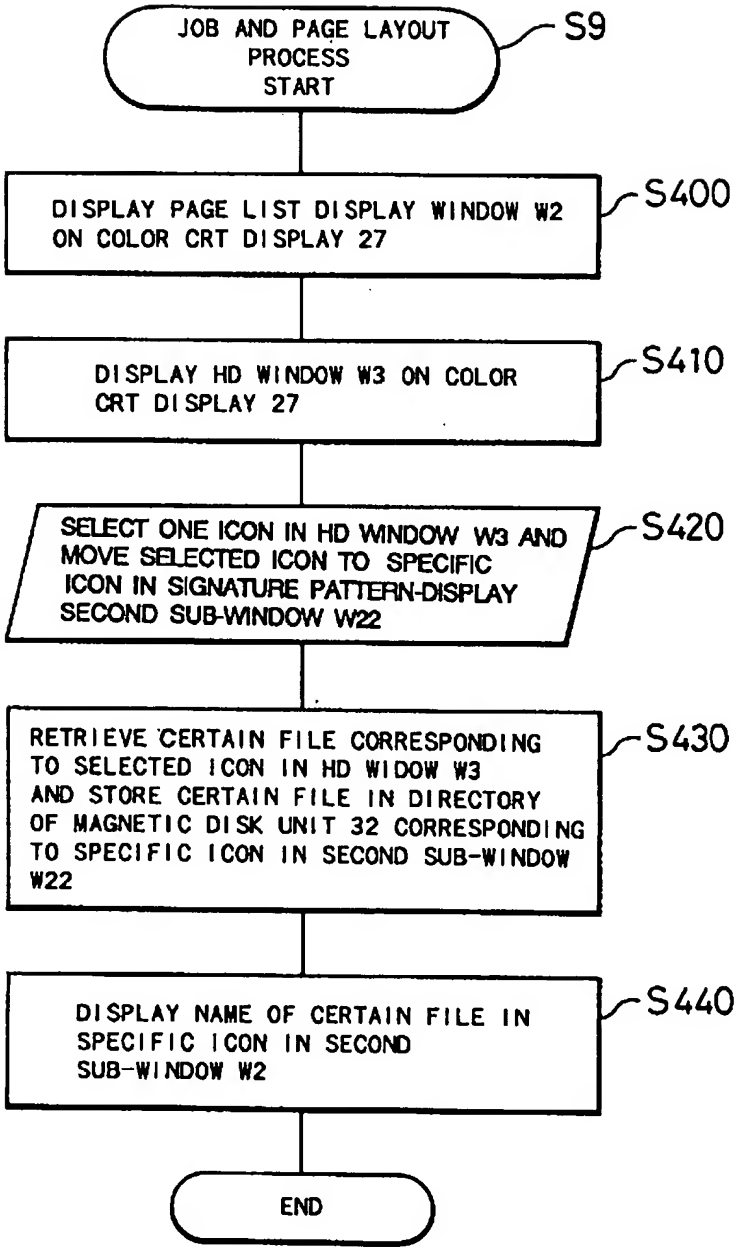

JOB AND PAGE LAYOUT PROCESS START
S9
DISPLAY PAGE LIST DISPLAY WINDOW W2 ON COLOR CRT DISPLAY 27
S400
DISPLAY HD WINDOW W3 ON COLOR CRT DISPLAY 27
S410
SELECT ONE ICON IN HD WINDOW W3 AND MOVE SELECTED ICON TO SPECIFIC ICON IN SIGNATURE PATTERN-DISPLAY SECOND SUB-WINDOW W22
S420
RETRIEVE CERTAIN FILE CORRESPONDING TO SELECTED ICON IN HD WIDOW W3 AND STORE CERTAIN FILE IN DIRECTORY OF MAGNETIC DISK UNIT 32 CORRESPONDING TO SPECIFIC ICON IN SECOND SUB-WINDOW W22
S430
DISPLAY NAME OF CERTAIN FILE IN SPECIFIC ICON IN SECOND SUB-WINDOW W2
S440
END

Fig. 15

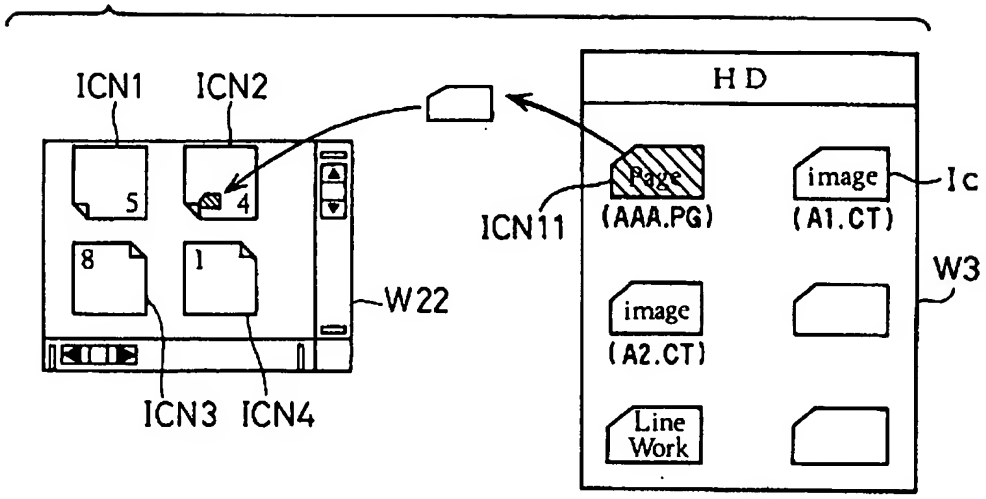

ICN1
ICN2
5
4
8
1
W22
ICN3
ICN4
HD
Page
(AAA.PG)
image
(A1.CT)
Ic
ICN11
W3
image
(A2.CT)
Line
Work

Fig. 16

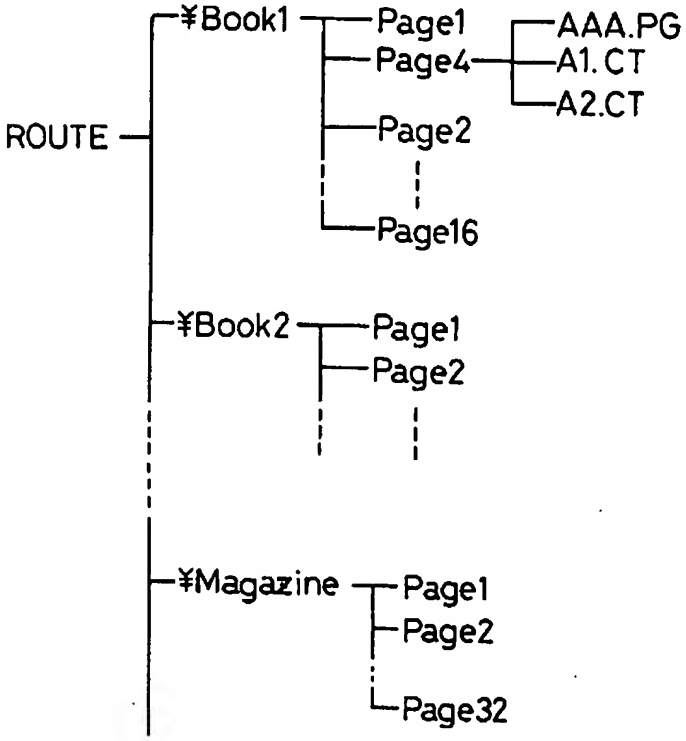

ROUTE
¥Book1
Page1
Page4
Page2
Page16
AAA.PG
A1.CT
A2.CT
¥Book2
Page1
Page2
¥Magazine
Page1
Page2
Page32

Fig. 17

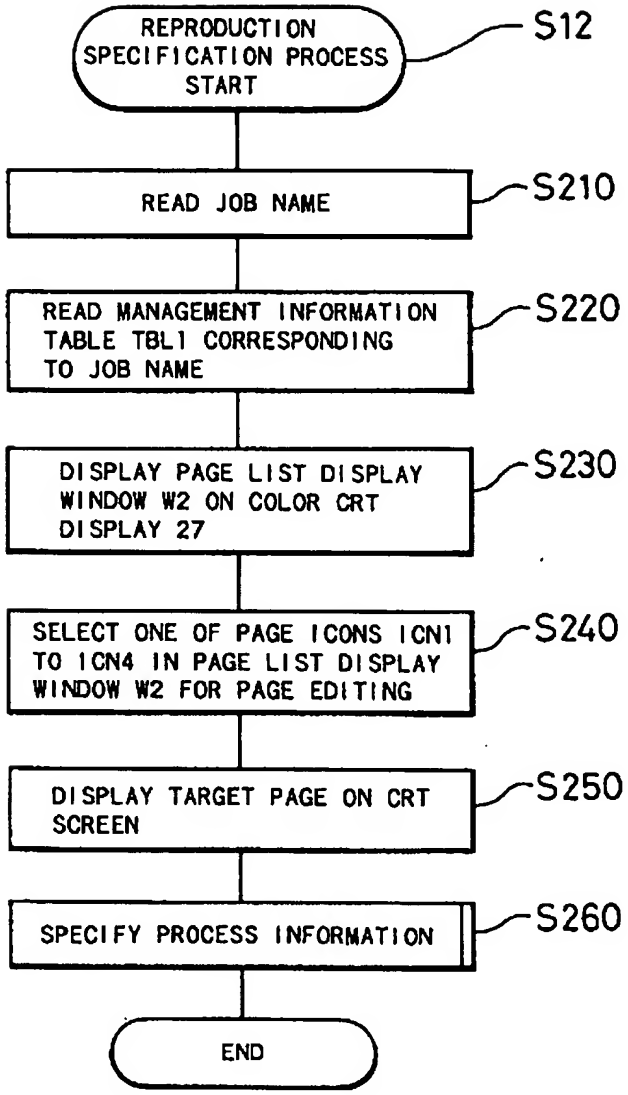

REPRODUCTION SPECIFICATION PROCESS START
S12
READ JOB NAME
S210
READ MANAGEMENT INFORMATION TABLE TBL1 CORRESPONDING TO JOB NAME
S220
DISPLAY PAGE LIST DISPLAY WINDOW W2 ON COLOR CRT DISPLAY 27
S230
SELECT ONE OF PAGE ICONS ICN1 TO ICN4 IN PAGE LIST DISPLAY WINDOW W2 FOR PAGE EDITING
S240
DISPLAY TARGET PAGE ON CRT SCREEN
S250
SPECIFY PROCESS INFORMATION
S260
END

Fig. 18

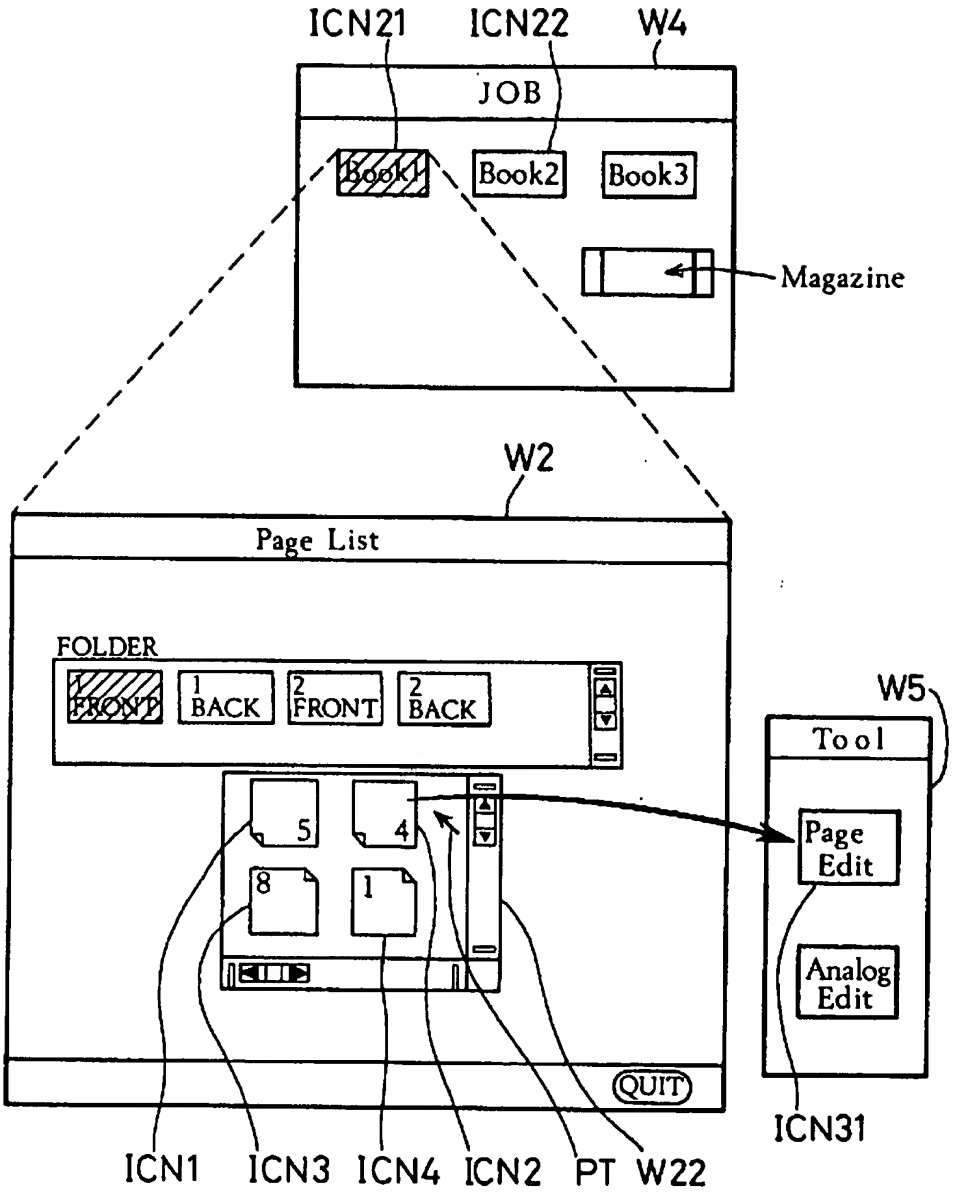

ICN21
ICN22
W4
JOB
Book1
Book2
Book3
Magazine
W2
Page List
FOLDER
1 FRONT
1 BACK
2 FRONT
2 BACK
5
4
8
1
QUIT
W5
Tool
Page Edit
Analog Edit
ICN31
ICN1
ICN3
ICN4
ICN2
PT
W22

Fig. 19(a) TRAPPING

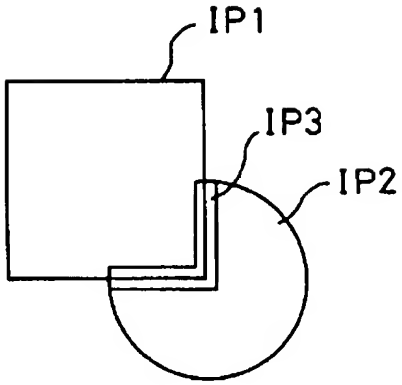


Fig. 19(b) OUTLINE

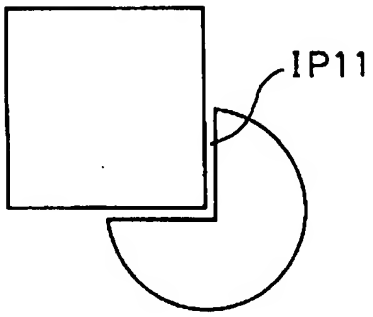


Fig. 19(c) OVERPRINTING

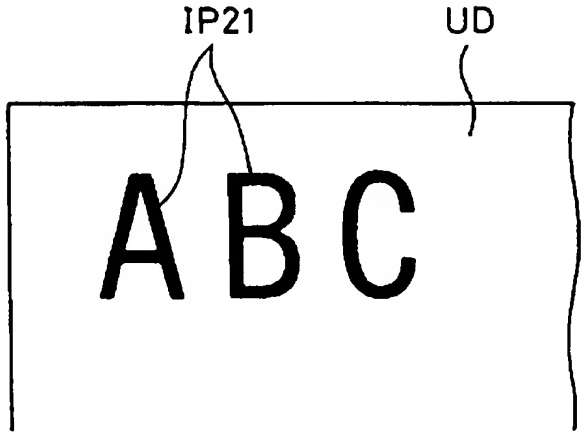


Fig. 20

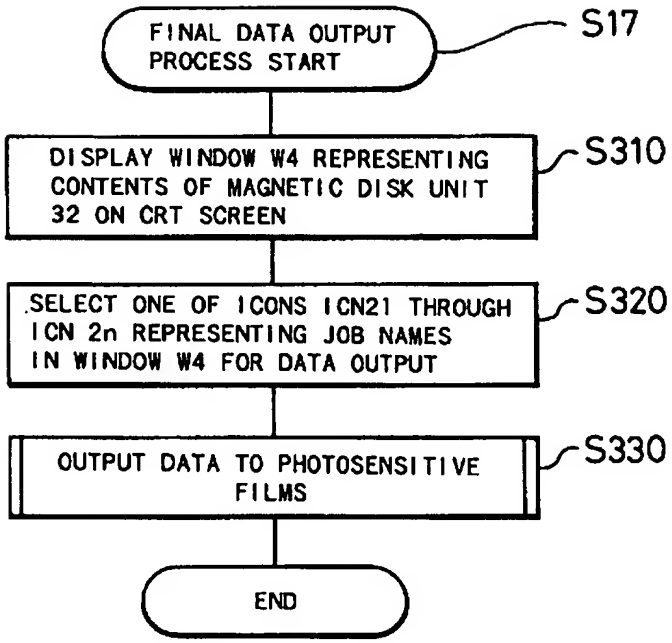
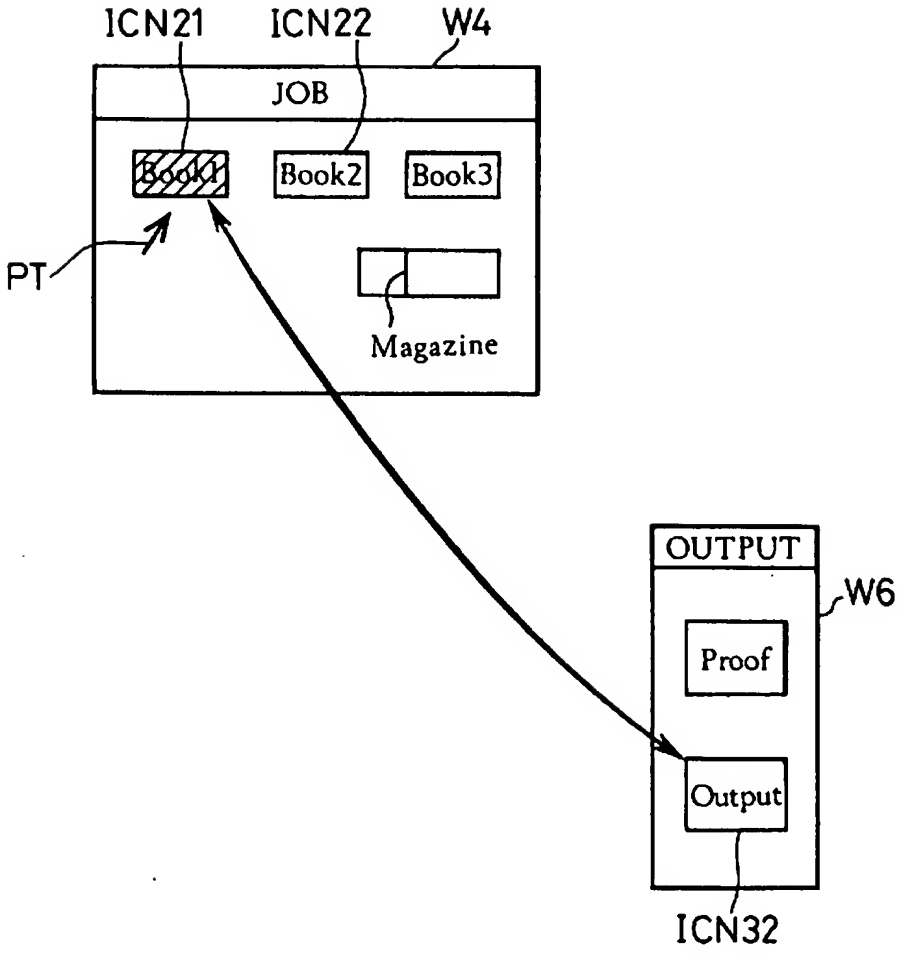

FINAL DATA OUTPUT PROCESS START
S17
DISPLAY WINDOW W4 REPRESENTING CONTENTS OF MAGNETIC DISK UNIT 32 ON CRT SCREEN
S310
SELECT ONE OF ICONS ICN21 THROUGH ICN 2n REPRESENTING JOB NAMES IN WINDOW W4 FOR DATA OUTPUT
S320
OUTPUT DATA TO PHOTOSENSITIVE FILMS
S330
END

Fig. 21


ICN21
ICN22
W4
JOB
Book1
Book2
Book3
PT
Magazine
OUTPUT
W6
Proof
Output
ICN32

Digital Color Printing in Japan: A Report from Early Users

AS WE HAVE OFTEN reported, the Japanese graphic arts market on the whole is a very conservative and cautious one, slow to adapt to the technological change that has been sweeping Western markets. So it may seem surprising that it is among the front-runners in embracing digital printing. But that is where it is. The first Indigo E-Print 1000 digital color printing presses to be installed outside of Israel were purchased and installed by Toppan Moore of Japan, even before the machine was formally announced at IPEX '93, and many more units have been installed in Japan since then. Meanwhile, Xeikon and Agfa have gotten their marketing efforts under way there. Agfa reports having installed five of its Chromapress systems there.

Japan is also where Indigo's concept of variable data or customized printing was formulated in conjunction with its business partners, Toppan Moore, its first major customer, and Toyo Ink, its distributor in Asia and Australia. We recall hearing from Indigo spokespeople about the concept of custom supermarket fliers, printed in four colors, containing different product offerings, depending on the demographics and buying power of the individual neighborhood receiving the flier (important in a country where a cantaloupe can cost $30). We were enchanted, intrigued and thoroughly convinced that customization was the real future of short-run color printing as Indigo launched its initial pitch.

Thus we were eager to visit a few Japanese digital printing sites to learn the status of the technology for custom printing, to see what kinds of work customers were producing and to find out how the technology was fitting into the market. We wanted to go where the pioneers are to see this.

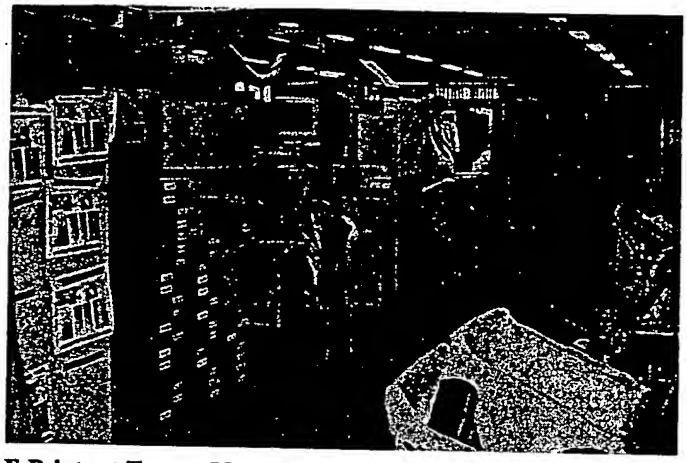
Caution reigns. We learned that although Japanese printing companies like Toppan Moore and distributors like Toyo Ink have been early adopters of digital printing—from Indigo in particular—they have been experimenting very cautiously with the technology and developing very carefully a realm of experience and expertise that they will be able to market to their customers intelligently (as opposed to frantically).

In other words, rather than diving into the new realm and then floundering in a market full of unknowns, the Japanese have taken the approach of making an investment for the long term, learning about the market and the technology, and then capitalizing on what they have learned. Thus, while digital printing entered Japan early in terms of product availability, it remains for the most part in the R&D stages and hasn't reached the point where it is a threat to the traditional printing business.

While we were a little disappointed that during our two site visits we didn't see any machines functioning at full production speeds, we learned a lot, including why the fast start has settled into a slow advance.

Among the things we learned was that, as a result of the slowness of traditional printers to adopt nonproprietary desktop publishing and prepress tools, there is a growing and perhaps pent-up demand among leading-edge graphic designers and corporate customers to explore digital printing and other new technologies.

This could bode well for printers and service companies that invest in digital printing early, especially if they can handle desktop files and accommodate innovation and new applications as designers experiment. We can envision some customers bypassing tradition-bound graphic-arts service suppliers in favor of those that have been experimenting—and gaining experience—with new technologies such as digital color printing.



E-Prints at Toppan Moore in Tokyo. Nine E-Print 1000s (the label says E-Press 1000) are installed at this facility and another four are in Osaka. At the end of the aisle is the prepress area housing a series of Macs, which send jobs to the E-Prints over an Ethernet. There is also a bank of ISDN lines coming into the prepress area to deliver work from six local print shops in the Toyko area to this centralized printing facility.

What we saw. We did get to see some samples of custom printing and the software Toyo Ink has developed to make personalization and customization possible on the E-Print. We also learned about Toyo's other efforts in the areas of color management—a field that goes hand in hand with digital color printing (and most other color imaging technologies). And we visited an innovative design and production facility, run as both an R&D subsidiary of Toyo Ink and a pioneering new business effort.

Toyo Ink Imaging Systems Lab

The Toyo Ink Imaging Systems Lab, a unique, high-tech facility, was formed to provide education services for prepress system users. About five years ago, it expanded its charter to include research and development in the fields of color imaging systems, imaging engines, and printing and prepress systems. Groups within the lab

I-Layout Generator. Toyo Ink has developed software to set up jobs for the E-Print, including items such as imposition. Called I-Layout Generator, it controls the handling of variable and constant page elements. This dialog for setting up a job includes basic information about the normal areas (fixed) and personal areas (variable).

are working on projects covering electrophotography, thermal-transfer printers, prepress proofing systems (this is where Toyo developed its InkProof positive film system, launched at IPEX in 1993), color management and matching, and soft-copy proofing, among other things. And, as is noted in our lead article in this issue, Toyo is licensed by Indigo to manufacture and resell ElectroInk for Indigo printing presses. We saw sample packaging for this ink during our visit.

As Indigo's business partner and distributor in the Far East and Australia, Toyo also functions as a system integrator and has developed software products to accompany the E-Print engine. Among them are I-Layout Generator, which formats data for variable printing on the E-Print engine, and T-Color, for color matching.

Variable printing

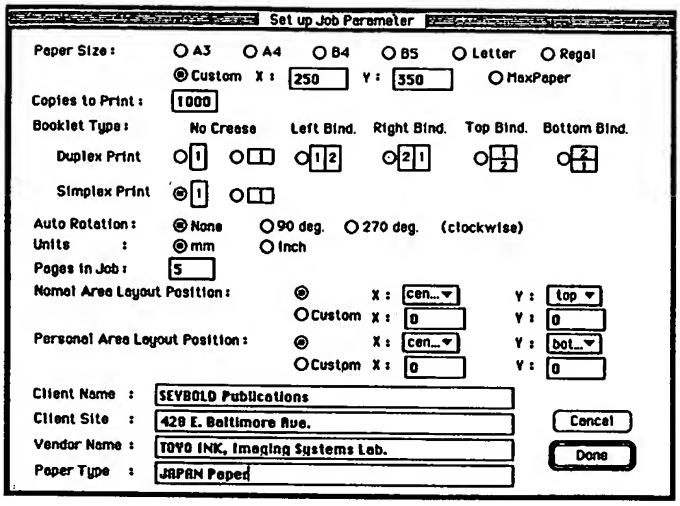
While the E-Print 1000 itself poses no technological restrictions as to how much content may be varied or customized on each individual sheet it prints, several front-end issues make variable printing more difficult to achieve.

Speed. The speed required to rasterize and feed data to the imaging engine for elements that vary from page to page is one area that is being addressed by faster and more capable RIPs. We have come to expect regular advances in throughput and productivity from RIP technology, and we will undoubtedly see more for both the Indigo and other digital printing engines as the year progresses.

Merging variable and static data. RIP speed is complicated in variable and custom printing by the requirement to merge one or more items from a file containing variable data (text or images) with static content in a predefined page layout, and then to rasterize the result and output it to the print engine (or to prerasterize standing page elements, define areas into which variable data may be inserted, select the variable elements, rasterize them and merge the two together for output).

The overall process is somewhat akin to database publishing (or the mail-merge capabilities of yesteryear's word processors), although perhaps it is more complex. There are several solutions emerging to handle the process, including products ranging from Quark Xtensions to those that reside in the RIP itself.

Format. The issue gets even more complex when the size, shape or appearance of the variable data is such that it varies the amount of or the organization of content on the page and, therefore, the entire layout. In our opinion, this is the most intriguing aspect of printing variable data on digital presses—the ability to create truly customized pages, brochures or supermarket fliers—based perhaps on database-supplied demographic data or individual users' buying patterns. Unfortunately, software to support this kind of application—an "elastic" page makeup module or something similar—doesn't exist. Likewise, it is our understanding that customers are just beginning to grasp the basics of variable printing on digital printing engines, so the concept is a little premature.



I-Layout Generator

Toyo's I-Layout Generator software for variable printing addresses a more standard approach than our "elastic pages" scenario. It acts as an imposition program and defines the position of both variable and constant page elements for a single page or a series of pages to be printed. At the present time, these elements must be either Scitex CT or LW files, although there is a version to be released soon (which we didn't see) to handle PostScript files. Both constant and variable elements are assigned to fixed positions on the page, although sizing of variable elements is somewhat flexible in that it can be determined automatically, based on the size of the largest item on a list of defined variables that can be placed on the page.

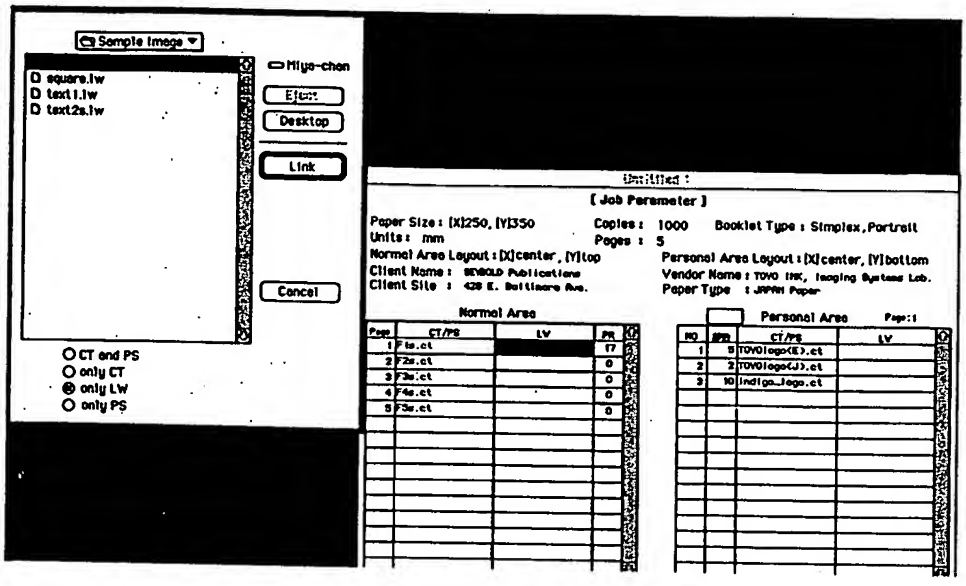
I-Layout Generator doesn't handle PostScript in the installed version because none of the E-Print sites in Japan are running the presses as PostScript devices (at least, they weren't as of our visit early in February). In part, this is because of the slow acceptance of PostScript in the Japanese market *(see our report on the Japanese market in Vol. 24, No. 12)*. But it also is partly because of the fact that, until recently, a PostScript RIP hasn't been available for the E-Print in Japan. All of the sites instead were operating with input in Scitex CT or LW format, and jobs coming into the shops as typical desktop work in Xpress or PageMaker first had to be converted to Scitex format. To handle this, Toyo also sells a Scitex VIP 2J RIP as a gateway.

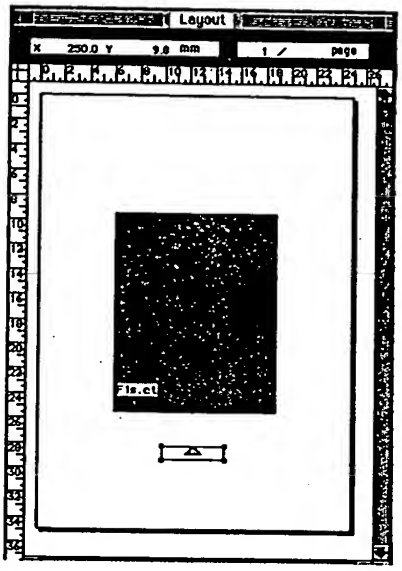
I-Layout Generator runs on a Macintosh. We saw it in use at two different sites on several different levels of Quadra workstations. It is not a WYSIWYG program *per se*. The user doesn't see the image content itself, but rather sets up a position for an object within the layout by defining its *xy* coordinates *(see photo on next page)*.

The first step in setting up a job with variable printing using I-Layout Generator involves setting up the job parameters. This is done by filling in the menu selections, as shown in the "Set up Job Parameter" dialog box above.

The selections include provisions for standard and custom paper sizes, number of copies to print, page and binding orientation for booklet-style printing or page orientation for simplex print-

Setting up fixed and variable elements. Using I-Layout Generator, the operator specifies the location and size of each normal and variable element on the page. *Left:* Here the element "F1s.ct" has been assigned as a normal area and we are about to assign a linework file as another normal element. *Right:* In this screen the user can visually verify and adjust the location and size of the areas imposed on the form.





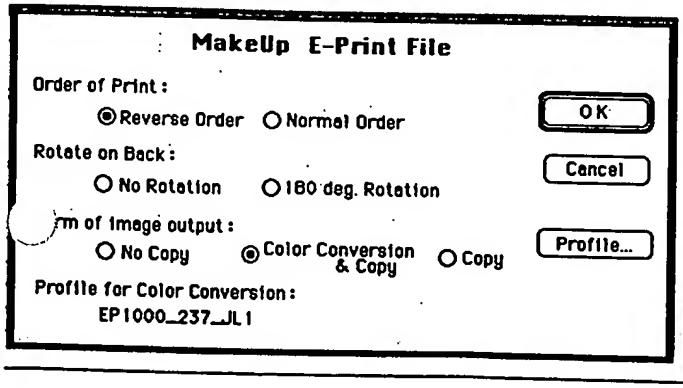
ing, automatic rotation of objects, the number of pages in the entire job and details like the client name, site, vendor and paper type. The most important parts of the menu are the *xy* coordinates of the nonvarying and variable components in the job. These coordinates can be set up differently for each of the multiple pages in the job.

Once the locations of the constant and variable content items on the pages of the job have been set up, the operator fills in the names of the files to be assigned to these positions—both constant and variable—into the menu shown above. Also in this menu the operator assigns the number of personalization areas to each page. It is possible to use the same personalization element in a number of copies of the same file. Likewise, we were told, it is possible to assign multiple files per personalization area.

It is not necessary to type the object names; they can be selected using normal Macintosh file selection conventions to fill in the form.

The next step is to verify or adjust the position of the files on the imposition form, which is done with the aid of visual feedback.

The final step is output using the "Makeup E-Print File" menu shown below. Note that in the screen dump of the menu a color-conversion profile has been assigned to the images on the page; this makes use of the T-Color color matching module Toyo has also developed for use with the E-Print *(more details below)*. I-Layout Generator was designed for use over a network. It will eventually perform color conversion and then copy the color image file (typically a CT) to the E-Print engine automatically.



Status. As of early February, there were four Indigo users in Japan running I-Layout Generator: KS Systems, Toppan Moore, I&I Co. Ltd.'s Hyper Design Lab and Toyo itself. However, we expect there will be more in the future as Toyo accelerates its sales effort, which was formally launched on Feb. 1 at the Page '95 expo.

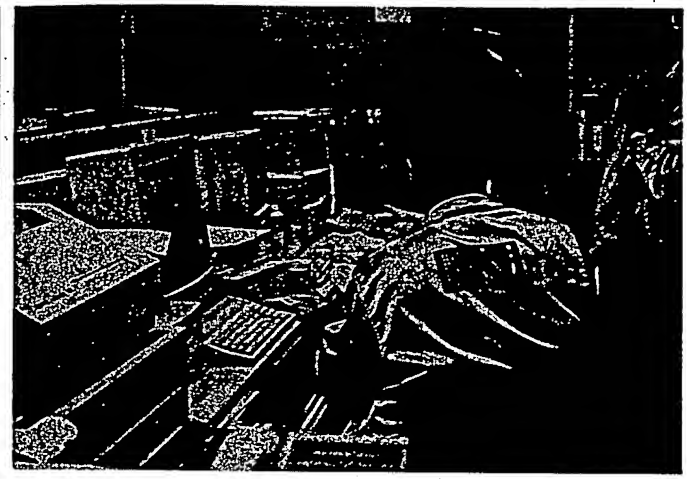
T-Color: color matching for the E-Print

Toyo also has developed its own color-matching software for the E-Print, which it calls T-Color. Right now the module doesn't work with I-Layout Generator, but we were told that it will when I-Layout Generator version 3.62 is released.

The E-Print system itself, in its version 2.1 software, provides for an internal, closed-loop, color-calibration process. To interact with this, Toyo has developed a profile form for use on the E-Print press. A customer prints the profile form (a series of color swatches) on his own press and sends it to Toyo for spectrophotometric analysis. Obviously press settings, paper stock, etc., will affect the color characteristics output on the form. Toyo uses these data to build a T-Color profile for that specific press, which can then be fed back into the closed loop. It is possible to develop and use a repertoire of different press profiles that vary, depending on the printing standard to which the press is set, the specific ink set, paper stock, etc. At the present time, T-Color works only with Scitex Handshake-format CT or LW files and, therefore, performs only CMYK-to-CMYK transformations.

We think T-Color (especially when running automatically within the I-Layout Generator version to be released), provides a

Desktop prepress at I&I. This membership facility provides desktop prepress and multimedia training, plus hands-on experience for designers and corporate communicators who want to use the Mac-based equipment. Film output is processed through a Scitex system for output on a Raystar, but desktop scanners and proof printers are also available, as are two Indigo E-Prints for short-run digital color printing.



good first step for users to match colors on the press and ensure consistency. But it has a distance to go in terms of providing functionality in a PostScript environment. We also think that eventually users will want tools for characterizing their presses (and other output devices) themselves, rather then sending forms to Toyo for analysis and profile development. And, as PostScript compatibility becomes more important in the Japanese market, compatibility with the ICC standard profile format and ColorSync 2, which is scheduled to be ready this spring, also will be a necessity.

ChromoBase: color matching for the Mac

Another application we saw is a Toyo-developed color-matching application for the Macintosh called ChromoBase (version 1.2J). ChromoBase is a general-purpose, color-matching module aimed at the desktop market—specifically at Macintosh users who want to match color on their displays and output devices.

Conceptually we found the software to be very much like Pantone's ColorDrive. ChromoBase functions as an electronic database containing a color swatch book that can be used as a Toyo Ink color finder on the Mac. It includes a swatch maker so users can send patches to their color printers to identify how specific colors will appear when printed on those devices. It also lets the user create custom colors on the screen and save them as EPS files for use in either Illustrator or FreeHand jobs. (ColorDrive lets users create custom color palettes and has the advantage of being compatible with a wider range of desktop software.)

ChromoBase is priced at about $280 in Japan. Introduced at Page '94, it has been on the market for about a year, available only in Japan.

With color-matching and color-management software becoming increasingly important, the lab's new focus is to develop color-management software that is compatible with ColorSync 2.0. Whether this is a new, expanded version of ChromoBase or another, different kind of color-management product, we will have to wait and see.

I&I Co. Ltd.'s Hyper Design Factory

I&I is a subsidiary of Toyo Ink, but it operates as a separate commercial venture. Its Hyper Design Factory serves as a multipurpose production facility, a desktop publishing and multimedia training center, a walk-in atelier for designers, and a color-separation and digital printing service bureau. It also functions as an R&D facility where Toyo Ink, prior to launching its sales efforts in Japan in February, has been able to learn more about how the E-Print (among other products) fits in a production environment and about the kinds of materials customers are interested in running on them.

On the business side, there are six commercial sales representatives selling I&I color-separation and digital printing services to the design, advertising, corporate and commercial printing markets. Toyo Ink sales representatives use I&I as a demonstration facility where they can show the E-Print in action.

Interestingly, I&I is a membership facility comprising more than 450 members from among graphic designers, ad agencies, corporate communicators and the like. It provides a full range of training courses and hands-on experiences for members (and other paying customers) who wish to learn about and gain experience using the latest Macintosh and PostScript graphic-design, imaging and page-production software available in Japan. Members can pay to use the inhouse equipment for production or they can leave their jobs on diskette (or send them over phone lines) for production or output services, much as they would at a trade shop or prepress service bureau in the United States.

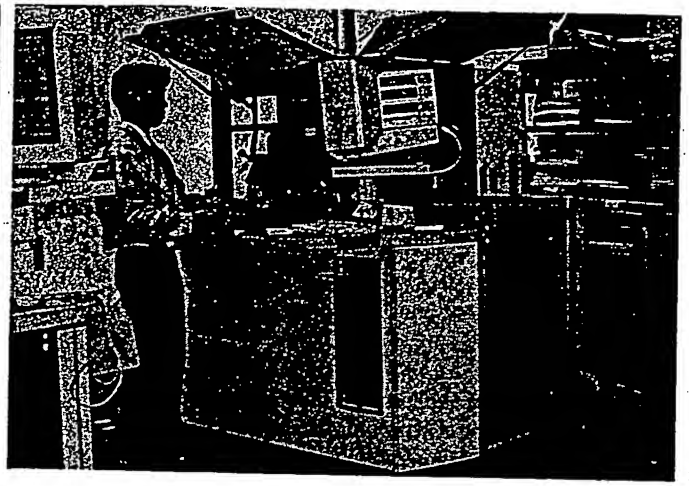
Beyond the Mac and PostScript equipment, I&I's repertoire includes additional tools for color prepress: a Scitex Gateway (from the Mac and PostScript), two Scitex Assembler workstations, a SmarTwo scanner (and desktop scanners such as an Agfa Arcus, Sharp JX-800 and LeafScan 45), a Raystar film imager for output, a Toyo InkProof film proofing system (introduced at IPEX in 1993 and installed at about 30 sites, all in Japan) and two Indigo E-Print 1000 digital presses.

E-Print in action

I&I has had the two E-Prints for about a year. As of early in February, it was running an average of 3–5 live jobs on the machines per day. This is not a high volume for daily production, but the site functions also as a Toyo Ink R&D and demonstration facility.

The quality of the sample E-Print work we saw was quite good. We were told that experience so far indicates that an appropriate maximum run length for the machines is about 500–1,000 impressions (not too different from the comments we got from a couple of U.S. users, who indicated that at about 500 impressions the price started to compete with offset printing). Unfortunately, no one at I&I would discuss the economics of the E-Prints with us, other than to state that it was too early to determine costs per page (I&I is still in the R&D stage) and that, as of February, they

Indigo at I&I. Both of the E-Print 1000s at I&I's Hyper Design Factory in Tokyo were down for periodic maintenance during our visit, but we saw some quite impressive output samples, including collateral materials being printed in preparation for Drupa.



viewed Indigo's ink prices as high. Also, because I&I's use of the E-Prints is for much broader purposes than just selling printed output, we suspect that an immediate financial payback on the equipment is neither a simple nor a critical concern.

We were disappointed to find both machines undergoing maintenance work during our visit. (We're puzzled as to why both machines would be taken out of commission at the same time.) We had expected—and hoped—to see a lively, bustling production environment. However, we have learned from other E-Print users that routine maintenance can occupy a considerable portion of a work shift. *(See comments from Toppan Moore, below.)*

Custom printing. We were surprised to find that I&I wasn't doing much custom printing. It had run a few personalized jobs using I-Layout Generator, most notably a series of award certificates for a calendar-design competition, where the names were personalized on each print. But the customization has been very basic—limited to personalizing names and addresses. Apparently customers are just beginning to learn how they can use customization and variable printing as an integral element in the overall job concept. As I&I gains experience using the medium, the level of customization undoubtedly will become more sophisticated.

Other kinds of work I&I has found to be appropriate for its E-Prints include short-run color sales literature and marketing materials (corporate collateral), retail marketing materials and even some point-of-purchase items.

I&I recognizes that in the future, customers will bring in new kinds of work as they begin to understand the flexibility and advantages of the medium and "use their imaginations." These include designs or jobs that may not even be feasible to produce cost-effectively using traditional technologies.

New business concept. I&I's operation is an interesting new business concept for several reasons, especially because of what it says about the state of desktop publishing in Japan. In a country where the graphic arts are still dominated by tradition and where most composition and prepress work is still performed by printers, the very modern, bright and compact facility, tucked away on a side street in a trendy section of Tokyo, is as unlike a traditional print shop as you can get.

One function is to help Toyo Ink develop a better understanding of its market and the tools it requires. Besides that, it is also positioned to capitalize on graphic designers' high level of interest in desktop publishing and prepress tools and in digital printing on the E-Print and like devices. Designers see digital color printing as a way to gain more control over their work, especially in terms of color and turnaround time, than is available to them from traditional printers. And from what we have learned about the desktop market in Japan, if traditional printers don't adapt more quickly to the new desktop technologies, they may get left behind as their more forward-thinking customers—graphic designers and corporate accounts—turn to new kinds of service bureaus, such as I&I, for their production needs.

Toppan Moore

No study of digital printing in Japan would be complete without a visit to Toppan Moore, Indigo's first site in Japan and its first E-Print site outside Israel. An early business partner credited with originating and helping Indigo formulate the concept of variable printing on the E-Print, Toppan Moore has installed nine E-Prints at its Tokyo location. Thus, we were eager to see what it has accomplished.

The Tokyo site is one of two Toppan Moore plants running E-Prints. The other, in Osaka, has four machines. However, Toppan Moore's expansion plans are ambitious and provide for additional machines and sites to be installed throughout Japan.

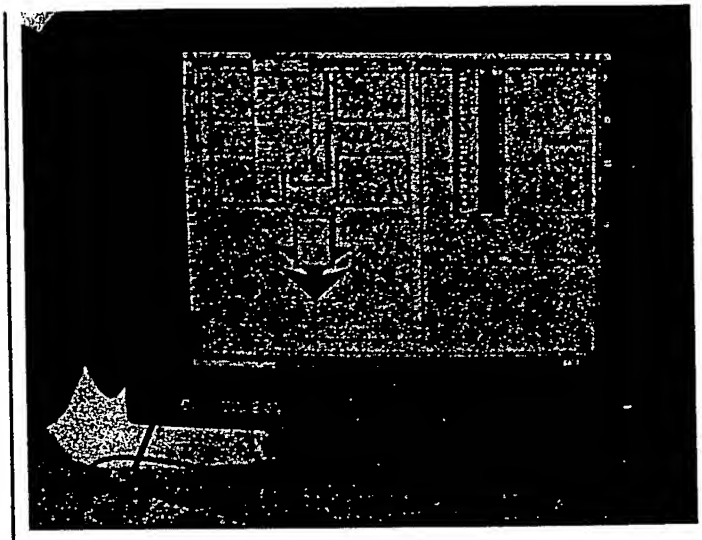
The facility we visited was well equipped to handle a lot of volume, although it did not appear to be very busy on the day of our visit. Of the nine machines, only two were actually running jobs. Admittedly, it was late in the day and Toppan Moore currently only operates the digital printing facility for a single, 7.5-hour shift per day.

On the front-end side of the presses, there are two "systems" feeding jobs into the workflow. One is a Mac-based system, called M-Ceps. The other, V-Ceps, runs on a Sun Sparcstation and brings variable information and other content into the workflow from a mainframe. The Mac system includes seven Quadras (650s, 800s and a 950). Several scanners, including a Smart 340 and an Agfa Arcus, bring hard-copy images into the system. There is also a Kodak DCS 200 digital camera on-site for use in catalog work. (It has been used to produce an office-products catalog.)

We were impressed to see a bank of ISDN lines coming into the prepress area, bringing work from six local print shops into the centralized digital printing facility. This communication capability will soon be expanded to include a link to Moore digital printing sites in the U.S.

As was the case at I&I, Toppan Moore operates the E-Print machines in Scitex format. Customer-supplied files (such as Xpress layouts, customer-supplied or locally scanned images, etc.) are raster-

Imposition with I-Layout. At this Mac workstation the operator is using I-Layout Generator to "impose" pre-rasterized CT or LW files on the press-sheet form for the E-Print. It is possible to indicate the position of both standard page components as well as variable components in this manner.



ized on a Scitex VIP 2J RIP, "imposed" for the E-Print using I-Layout Generator software on the Macs and sent over an Ethernet to one of the nine Chooser-selectable presses.

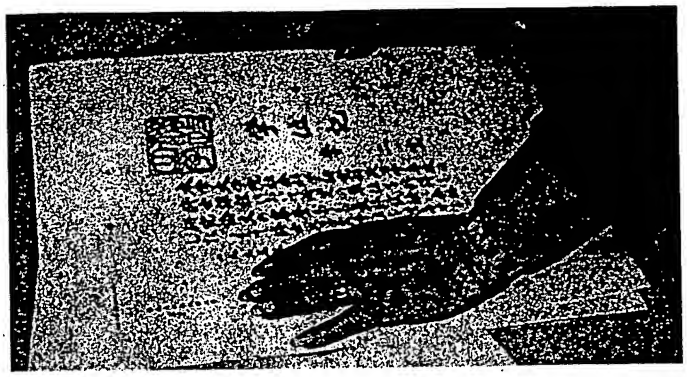
Variable printing. As we had seen earlier, the variable or custom printing work Toppan Moore has handled to date has been limited to basic personalization. We were told that it is possible to customize the image content on a page, but Toppan Moore is not doing so yet. We saw an example of variable printing of graduation certificates for university students in which both the students' names and the school curricula were personalized. The text files originated on the mainframe and, interestingly, the remainder of the page originated as a scanned image file (as opposed to a page layout file). However, Toppan Moore has also handled variable work that merges text into a Mac-page layout (both are rasterized and then imposed using I-Layout Generator).

Quality issues

Although the timing of our visit to Toppan Moore may not have coincided with a period of peak productivity on the E-Prints, we did see an impressive number of sample jobs printed on the machines. We noticed a definite progression toward better quality from the earlier to the most recent samples as a result of retrofitted refinements made by Indigo, along with Toppan Moore's growing experience in using them. Interestingly, we learned that none of the E-Print operators had had previous printing experience.

Among the samples we were shown were numerous corporate collateral pieces and related sales literature, including product data sheets and brochures. There also were numerous point-of-purchase materials and retail signs. However, the samples we saw did not include high-end consumer merchandising materials where color and quality are critical—for example, for items such as clothing, automobiles, food and cosmetics.

Personalizing with E-Print. This certificate for a student at a university in the Toyko area shows the name of the student and the curriculum (although the hand in the photo is covering the name of the school). Personalization data from a mainframe were merged with the remainder of the page content, which originated as a scanned image.



Speed, not color. We were told that in many of the jobs Toppan Moore processes, it is more important to achieve fast turnaround than color match and color consistency. For example, we saw several samples of a 52-page catalog and sales manual for a cosmetics company that included 200 continuous-tone images. The print run was 60 copies. The entire job, including the scanning, was processed in three days. It took two days to handle the prepress work, and another day to print and check the pages.

In the samples we saw, the color quality and skin tones were not particularly impressive, but the requirement in this case was speed, not color quality. Furthermore, in Japan, a job of this type couldn't have been printed in four colors or turned around as fast any other way for a realistic price. Apparently the customer was pleased with the result. Shortly after receiving delivery of the job, the customer placed a follow-on order, with some modifications, for an additional 400 copies of the manual.

Another example of this short-run, fast-turnaround capability was a project to print custom New Year's cards solicited as part of a promotion run by Too. Software (a well-known software and desktop publishing equipment distributor in Japan). Customers used their desktop software to design their own cards. More than 500 different jobs came in to Too. and were turned around quickly at Toppan Moore on the E-Prints as part of the promotion. The average print run was about 150 prints per design; some of the jobs were basic text-oriented greetings, but many were highly creative and even elaborate designs.

Business aspects

Despite the fact that the first machines were installed before IPEX in 1993, and despite the impressive sample book we saw, we were told that Toppan Moore does not yet feel that it is operating at full productivity with the machines. Rather, it is still in an R&D phase, exploring the medium and its capabilities.

This exemplifies the cautious way in which even a leading-edge printer like Toppan Moore is approaching building a business in digital color printing. Right now, we were told, downtime to perform maintenance on the machines occupies about one-third of the single 7.5 hour shift during which the digital printing facility operates each day. The goal it is working toward is much lower—10% downtime for maintenance.

Toppan Moore also has learned that digital printing on the E-Print is only cost-effective in quantities of 1,000 or fewer.

The bottom line. Toppan Moore also has learned in its experience to date that digital printing on the E-Print is only cost-effective in quantities of 1,000 or fewer. (Some other customers have put the number at 500.) For more than 1,000 copies, it feels that it is less expensive to print on a traditional offset press. There was no comment regarding the cost-effectiveness of variable printing, but we wonder—at least for some samples we saw—if it wouldn't have been less expensive to personalize offset prints on an ink-jet printer.

Its exploration of digital printing has earned Toppan Moore considerable notoriety in Japan (and elsewhere), and it has a considerable lead on its competitors, which are just now considering the business potential of digital printing using Indigo, Xeikon or Agfa machines. (The latter two also are now available in Japan.) We were told that the business is building steadily, and Toppan Moore expects to achieve profitability this spring.

Mitsui & Co. Graphic Systems Ltd.

Our final report comes from another leading-edge Tokyo graphic-arts business, Mitsui & Co. Graphic Systems. This three-year-old reseller of desktop publishing and prepress systems, which had its own exhibit at Page '95, is an Agfa, Apple and Silicon Graphics dealer and system integrator. (Twenty percent of it is owned by Agfa.) It has just begun its own marketing efforts as a reseller of Chromapress systems. (Agfa also sells the Chromapress through direct channels in Japan.) With its first demonstration unit on order, Mitsui has hired two engineers to work with the machine and develop sales and end-user support.

Market is primed. Comments from Kazutami Ando, president, regarding the market for digital color printing in Japan echoed what we had learned during other site visits in Tokyo. The market is primed and the medium has received a lot of attention. Ando believes that the ability to print price-sensitive retail signs and related point-of-purchase materials is one of the most significant applications digital presses will address.

He added that potential Chromapress customers are already flocking to his door. However, since a finite number of machines initially will be imported into Japan, prospects wanting to buy a machine are required to put together a business and marketing plan. In other words, they are required to make an investment in the success of the medium in its market beyond paying for the unit itself. This is another example of the level of caution and planning, this time on the part of both Mitsui and Agfa, that is typical in Japanese business.

Mitsui & Co. Graphics exemplifies the patience required of those involved in desktop publishing and prepress work in Japan. Ando, who is on the board of the JPC (the Japanese Publishing Consortium, discussed in Vol. 24, No. 12), told us that for the past five years he has heard that "this is the year desktop publishing will take off in Japan." He's hoping this will finally happen in 1995.

Nonetheless, his three-year-old company has grown to employ about 25 people, with sales offices in both Tokyo and Nagoya. The long-term plan, as the market grows, calls for expansion beyond these cities. The four branches of its business, as described by Ando, are consulting and sales, R&D, training and instruction, and on-site support.

Products. Mitsui & Co. develops custom software, sometimes to the specifications of its leading-edge customers, which include Toppan and Dai Nippon Printing. The company's software development efforts include stand-alone applications and utilities. Also a Quark Xtension developer, it has developed a database publishing Xtension called DBLinker, which brings material from another inhouse-developed product—a text and image database called MGS LisaBase—into Xpress layouts. Another product, Re-size Assistant, resizes Illustrator graphics while maintaining line-weight proportions.

The company is developing a table formatter for Japanese tables, but, rather than a Quark Xtension, it uses QuickDraw GX for building tables. Finally, it is exploring and building a base of expertise on desktop publishing for Windows—very new in Japan.

Mitsui & Co. also runs a training facility for desktop publishing operators. Trainers are based both in Tokyo and Nagoya. Begun as a service to customers, it has been expanded to accept potential customers as students. Full customer support is also an important part of its business.

Conclusion

Although the first digital color presses were installed in Japan, the early users we met have been cautious and studied about marketing their new capabilities. While these early adopters are less tradition-bound than others in the graphic arts in Japan, they have been careful to understand and build expertise around the new medium, rather than jumping into a new market full of unknowns. Despite being slow to get some momentum going (after a fast start), we remain convinced, as do the companies whose sites we visited, that the technology is poised to catch fire.

One of the strongest potential markets for digital printing in Japan may be among leading-edge customers that have already adopted desktop design and prepress tools and want to go around the traditional suppliers that have been slower to make changes to meet their needs.

The cost advantage and return on investment to buyers of digital printing, over more traditional (and emerging alternative) methods, remains an open issue. Real cost per page remains high, although it is probably too early to assess what this means to the success of the marketing of the medium. And while we remain intrigued by the concept of variable or custom printing as an important advantage to printing on digital presses, it will be a while before this potential is fully realized. Both digital press suppliers and, more important, customers designing jobs to print on them, have much to learn about both the basic and the more advanced capabilities of the machines.

Arlene E. Karsh